THE EFFECT OF COMPUTER ASSISTED LANGUAGE LEARNING (CALL) ON ENGLISH LANGUAGE LEARNERS' PRONUNCIATION IN SECONDARY SCHOOL IN PAKISTAN

PERVEEN AKHTER FARHAT

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Awang Had Salleh
Graduate School
of Arts And Sciences

Universiti Utara Malaysia

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Abstract

Pronunciation is a central component of speaking module in second language learning. However, it has always been neglected in the traditional second language learning classrooms. Mispronunciation impedes the communicative competence to a greater level. Pronunciation through computer-assisted language learning provides many advantages regarding improving phonemic sounds. The study aimed at evaluating the effectiveness of CALL to teach the segmental features of pronunciation: monophthongs, diphthongs and consonant sounds. An experimental study was designed in which 70 participants were selected from a public high school of Hasilpur Pakistan. The participants were divided into two groups: Experimental Group 1 and Experimental Group 2. A pronunciation test was utilized for pretest and posttest, consisting of 44 phonemic sounds. The duration of the treatment was six weeks in 46 sessions. Experimental Group 1 was taught phonemic sounds in a computer lab by showing phonetic videos and listening the different IPA sounds and symbols through Cambridge Advanced Learners' Dictionary. Experimental Group 2 was taught the same material by teaching pronunciation without CALL. The mean scores of the pretests and posttests were analysed through SPSS using independent samples t-test to see the difference between the mean scores of both groups. The findings of the quantitative data showed that the group that received the treatment of phonetic videos and digital dictionary via computer performed better in learning the phonemic sounds than the group that received the treatment of pronunciation teaching without CALL. The current research is beneficial in promoting pronunciation teaching using CALL to address the segmental issues of pronunciation in Pakistan.

Keywords: Pronunciation, CALL, Phonetic videos, Vowels, Consonants

Abstrak

Sebutan adalah komponen utama modul pertuturan dalam pembelajaran bahasa kedua. Bagaimanapun, sebutan selalu diabaikan dalam bilik darjah pembelajaran bahasa tradisional yang kedua. Kesilapan sebutan menghalang kecekapan komunikatif pada tahap yang lebih tinggi. Sebutan melalui pembelajaran bahasa berbantukan komputer memberikan kelebihan yang besar mengenai peningkatan bunyi fonemik. Kajian ini bertujuan untuk menilai keberkesanan program CALL untur mengajar ciri-ciri segmen Sebutan: monophthongs, diphthong dan bunyi konsonan. Satu kajian eksperimental dibentuk di mana yang terdiri daripada 70 orang peserta daripada sekolah dari menengah awam Hasilpur Pakistan telah dipilih. Yang peserta dibahagikan kepada dua kumpulan: Kumpulan Eksperimen 1 dan Kumpulan Eksperimen 2. Ujian sebutan digunakan untuk pra-ujian dan pasca-ujian, yang terdiri daripada 44 bunyi fonemik. Tempoh kajian ialah 6 minggu dalam 46 sesi. Kumpulan Eksperimen 1 diajar bunyi fonemik di makmal komputer dengan menggunakan video-video fonetik dan mendengar bunyi dan simbol IPA yang berlainan menerusi Kamus Cambridge Advanced Learners. Kumpulan Eksperimen 2 diajar bahan yang sama menggunakan dengan mengajar sebutan tanpa CALL. Skor min bagi pra-ujian dan pasca-ujian dianalisis melalui SPSS dengan menggunakan sampel bebas ujian-t untuk melihat perbezaan di antara skor min kedua-dua kumpulan. Penemuan data kuantitatif menunjukkan bahawa kumpulan yang diajar menerusi video-video fonetik dan kamus digital menggunakan komputer melaksanakan dengan lebih baik dalam mempelajari bunyi fonemik berbanding kumpulan yang menerima rangsangan pengajaran sebutan menerusi tanpa CALL. Kajian semasa ialah/adalah bermanfaat untuk menggalakkan pengajaran sebutan menggunakan CALL untuk menangani masalah segmen sebutan di Pakistan.

Kata kunci: Sebutan, CALL, video Fonetik, Vokal, Konsonan

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CHAPTER ONE

INTRODUCTION

This chapter discusses background of the thesis, followed by the statement of the research problem, objectives, research questions, hypotheses of the study. The chapter also entails conceptual framework, significant of the research, operational definition of the variables and major terms along with summary of the chapter.

1.1 Background of the Study

Pronunciation is a key aspect in any language and plays a vital role especially regarding learning and teaching of learners' communicative competence. Pronunciation has is more imperative than vocabulary and grammar (Harmer, 2001). Good Pronunciation may facilitate a learner by making communication easier, relaxed as well as more successful (Varasarin, 2007; Dan, 2006). While, Miller (2004) highlights that pronunciation affects someone's self-esteem and level confidence to utter understandable speech.

Pronunciation has always been ignored throughout the language learning process (Gilner, 2008; Baker & Murphy, 2011; Derwing, 2010). However, in Pakistani context it has always been ignored throughout the language learning process and it is considered that pronunciation is learnt through the other skills of the language instead of paying attention on oral skill (Mansoor, 2005). It is also ignored throughout the world no attention is paid to develop this skill in language learning classroom (Gilner, 2008; Baker & Murphy, 2011; Derwing, 2010). It has become 'Marginalized Topic" as well as it is considered "an

ESL/EFL orphan" of English language family (Gilbert, 2012; Levis & Grant, 2003; Egwuogu, 2012; Hietanen, 2012, Bardakçi, 2015, Kanoksilapatham, 2014).

Gilakjani and Ahmadi (2011) state that "second language pronunciation is a topic of great theoretical interest and practical relevance which unfortunately has been out of fashion for some decades" (p. 81). Celce-Murcia, Brinton and Goodwin (2006) assert that there is least possibility for effective communication without accurate pronunciation. "The way we sound when we speak a foreign language has a strong influence on the assumptions other people make about us and the judgments they make about the sort of people we are" (Laroy, 1995, p. 3).

Shahzada (2012) denotes that other (receptive) components such as vocabulary, grammar, reading and writing, are taught with greater emphasize while, pronunciation (productive skill) is almost not focused and very few Pakistani have ability to understand English pronunciation. Pronunciation is the most neglected and ignored area of language skills in Pakistan. As a result, Pakistani learners are facing much difficulty to get command over pronunciation of English Language. Learners must understand both the features of pronunciation, i.e., segmental and suprasegmental to communicate in a better way in a foreign language context. It is one of the "most important aspects in learning a second language (Hurtado & Estrada, 2010, p. 74). "Consonant and vowel sounds, changes to these sounds in the stream of connected speech, word stress patterns, rhythm, and intonation – what might be described as the 'nuts and bolts' of pronunciation" (Jenkins, 2004, p. 1)

So, it is very necessary to get command over these basic features of pronunciation. However, it is not focused at beginning or advanced level and there is no room for teaching pronunciation in second language classrooms.

Gilakjani (2012) highlights that pronunciation at understandable level plays a major role in language learners' competence. Nevertheless, pronunciation is considered "Cinderella" of second language teaching (Kelly, 1976). Cinderella is a children story and, in this story, "Cinderella" is the name of a girl who is treated badly by her step-mother). Therefore, when one thing is ignored and not given attention properly, the title of "Cinderella" is given to that person or thing). Different researchers have the opinion that pronunciation should be focused and emphasized at initial level of language learning. If it is ignored, pronunciation problems can cause misunderstanding (Hahn & Watts, 2011).

Fraser (2000) signifies that "by far the most important with good pronunciation, a speaker is intelligible despite other errors, with poor pronunciation; a speaker can be very difficult to understand despite accuracy in other areas" (Fraser, 2000, p. 7). Pronunciation is treated as EFL/ESL orphan in applied linguistics family. Empirical researches indicate that it is a worldwide problem (Gilbert, 2010). "Despite teachers' increased interest in pronunciation in recent years, as evidenced by the establishment of a TESOL interest section and a proliferation of pronunciation materials for learners, it remains a marginalized topic in applied linguistics" (Derwing & Munro, 2005, p. 382).

Additionally, the use of computer assisted language learning (CALL) in teaching of English language is a novel idea. Although, it is considered as an assisting agent for teaching of different subjects. However, its usage to enhance speaking skills and

especially in teaching and learning of English language pronunciation is very limited in developing countries like Pakistan. Whereas, the advanced countries are using computers in language learning with considerable outcomes.

Nevertheless, in Pakistan, computer assisted language learning (CALL) is in infancy and there is a need to conduct such studies focusing on usage of computer with pronunciation teaching (Farhat & Dzakiria, 2017). Thus, an attempt was made through this study to uncover the effect of CALL on secondary school English language learners' pronunciation as this field is vacant especially in Pakistani context no praise worthy task is done so far.

1.1.1 Negligence of Pronunciation in Worldwide Perspectives

There are many researches which show that that pronunciation is very basic and important component of speaking skill; however, it is ignored in most of the language learning environment. Pronunciation is a main factor for effective communication. It is necessary for a person that s/he must have proficiency in pronunciation to converse with native or non-native speakers in a purposeful way. On the other hand, it is not given growing attention rather; it is ignored willingly or unwillingly by the language teacher at every level in language classrooms. Por and Fong (2013) state that because of its complicated phonemic nature, intricate phonetics, phonological system, multifaceted and articulatory features, teaching of pronunciation has always been avoided deliberately.

Meaningful communication is possible when speaker and hearer should share their knowledge about pronunciation of sounds, sentence pattern and word structure along with

understanding of meaning in that particular language (Egwuogu, 2012). He further points out that because of this reason, an ESL teacher must pay remarkable consideration to teach basic elements of a language and this ability (mastering core features of the language) accelerates national acceptability and international intelligibility. Therefore, individual sounds segments, suprasegmental elements should be taught to learners in teaching pronunciation.

Roach (1998) sheds light that this trend has become a fashion to treat pronunciation as an outdated activity and the misconception that language teachers and linguists claim behind this tendency that teaching pronunciation bounds the learners to get native like sounds and accent. He went on saying that there is no any course which emphasizes native-like or perfect speaking rather they intermingle the two /concepts of model and goal. A model could be RP but the goal to teach pronunciation is a successful communication.

Morley (1991) adds that there is a constant increase in population of non-native English speakers in business, technology and industry and in other professions in English speaking areas. Non-native speakers (NNs) are employed by large corporations and small companies in English speaking setting. According to the legislation of the United States Congress passed in 1991, then immigration quota for talented and experts was raised from 55,000-140-000 a year. Apart from this, there is also growing population of employers and employees who are trying to involve in business and industry. So, this job-related use of English is necessary with the least understandable speech and affective communicative expertise.

Gilbert (2008) explains that mostly teachers present the excuse of time constraint for teaching pronunciation in the class. She expresses that whenever, if they have time to teach pronunciation, the practice is limited to some boring and monotonous drilling of unrelated topics. Mostly drilling of the sounds of minimal pair work discourages the learners and trainers. That is why teachers avoid teaching pronunciation. Shooshtari, Merabi and Mousavainia, (2013) state that "despite the importance of pronunciation the reality is that in many Iranian English language classrooms, little attention is paid to teaching pronunciation" (454).

Egwuougu (2012) expressed that:

> A student who aspires to speak English proficiently at an acceptable and intelligible level must be taught how to pronounce the sounds accurately. This is the task facing the teacher of English. But how many of them can really pronounce the English sounds well enough to the level of international intelligibility since they themselves were not introduced to the sounds of English enough before fossilization of wrong pronunciation? (Egwuougu, 2012, p. 213).

Fraser (2001) interprets that there is worthwhile difference between knowing a language and usage of language with fluency. She elaborates that to know a language means to understand many words in that particular language but to use the language with full command means, a learner must have awareness of phonological concepts. Conceptualization speech means to understand with regards to sub-lexical units such as phonemes, syllabus, tones, long and short vowels, stressed and unstressed parts, hard and soft consonants etc. Actual learning of pronunciation does not depend upon only providing information but it also takes account of some experience and practice on the

part of a teacher. Therefore, if learners want to improve their performance in pronunciation they should utilize the good deal of time in actual speaking.

Every language has its own sound system but most of the languages have some similarities and differences with other languages and those similarities and difference between L2 and mother tongue should be identified (Egwuougu, 2012). Furthermore, he describes that to learn a second language; every normal child has to get awareness, rules, guidelines, knowledge of phonological structure of the sounds, their formation, combination, articulation and production as well. So, that is why in ESL situation, primarily it is the teacher's task to focus on basic language features that can increase national acceptability and international intelligibility. The learner can comprehend and make the native people of target language to be understood his/her speech as well. That is why, a careful decision should be made which pronunciation features, i.e., individual sound segments or prosodic features must be more focused or emphasized in pronunciation teaching. For the purposeful, fluent and understandable speaking the speaker must get mastery over sound system (Por & Fong, 2015).

Hewing (2004) indicates that the aim of pronunciation should be understandability of pronunciation in most situations, with maximum people also with the native and nonnative English speakers. He further explains that a person's pronunciation donates his own national or first language identity and people want to retain this identity. For example, an Italian must like to show himself as a good Italian nonnative English speaker rather than simply a nonnative English speaker.

Fraser (1999) denotes that there can be a substantial discrepancy between "what people think they are saying, a phonetic description of the sounds they are actually producing, and how someone from a different language background describes their speech" (p.2). She further states that learners may not realize that they sound different from the teacher or an audio tape but "EFL teachers should know exactly the English sound system and how it works as well as how English sounds system are different from other sound's systems" (Huwari & Mehwesh, 2015, p. 31).

Gilbert (2010) called pronunciation "an orphan" of English language. Teachers start with alphabet along with identification of the sounds of the target sounds and after that, it is not given least attention (in language classrooms). However, in Pakistan, this least attention is also ignored and no single teacher think to teach segmental or suprasegmental features inside the language learning classroom. Therefore, it is highly desirable to conduct studies in Pakistani context especially on segmental features of pronunciation.

Derwing (2010) states that although, a lot of work has been done by some researchers, promoting teaching pronunciation in ESL. However, pronunciation has always been obsoleted in many language programs. She went on to say that many researchers and practitioners postulate that pronunciation appears to be an orphan of second language learning and teaching just because of its being neglected. The negligence of this skill is mainly due to the fact that listening and speaking are not valued because these skills are not tested in any exam formally or informally. It is assumed that these skills (listening and speaking) would be developed by natural process as it happens in first language (L1) and in second language contexts.

Gilakjani (2012) indicates that communication is an interactive relationship between speaker and hearer, it indicates that the speaker communicates in a way that listener understand properly without any difficulty. Harmer (2001) discusses that almost majority of English language teachers pay attention on receptive skills like grammar and vocabulary as well as emphasize on functional items but they do not teach pronunciation. He points out that majority of them, are reluctant to teach their learners the sounds as well as stress and intonation and they declare that even without paying attention on prescribed pronunciation syllabus, most of the learners would be able to get this proficiency by themselves.

Kelly (2001) highlights that mispronunciation of a language may cause extremely problematic for a learner while communicating with speaker of another language community and this situation is very frustrating for the learner who may have good command over grammar and lexis and is having difficulty to understand or being understood by the native speaker. She further explains that the teacher should prepare lesson in such a way that he/she should focus not only on particular language structure or lexis but also needs to include features of pronunciation in order to give learners the full picture and a better understanding to communicate successfully.

Burns and Claire (2003) signify that if a nonnative learner has good pronunciation, he can do better communication despite of having some minor inaccuracies in vocabulary and grammar. Thornbury (2005) states that because of lacking speaking perspective, learners feel that they are good at grammar and vocabulary but they think that they are unable to use the language outside the classroom. Lacking fluency in English language creates difficulty in finding a chance of good jobs (Tunio, Eng & Ismail, 2015).

Hietanen (2012) emphasized that pronunciation should be focused at early stages for accurate pronunciation and poor pronunciation creates much trouble and difficulty for the learners to correct those problems learnt by learners at initial level. He further states that pronunciation is not paid any importance in language pedagogy accordingly and native models are treated as standards only. The result of this negligence, learners feel embarrassment in oral communication. Although some senior students (at the university) were taught pronunciation of individual sounds but they were unable to get perfection in pronunciation (Hietanen, 2012; Egwuogu, 2012). If learners have difficulty in pronunciation especially in phonetics, they lose their confidence in speaking and listening (Zhang & Yin, 2009). Egwuogu (2012) also presents the same situation by saying that to get proficiency level in English language; learners are expected to be taught all aspects of language.

The reasons of this obsoleted skill (pronunciation) are; shortage of time, teachers are not experienced regarding teaching of pronunciation, they focus on vocabulary and grammar and do not think about pronunciation teaching. Apart from this, teachers neither do prepare themselves for pronunciation teaching nor they try to receive any extra training in this field. Walker as cited in Gilbert (2010) has conducted survey on 350 English teachers in Spain. Among them 65% respondents wanted to improve their pronunciation. However, 75% teachers confessed that they were not given little or no special training in the teaching pronunciation. Lee (2008) postulates that to achieve the goal of oral skill, pronunciation should be the part of the English curriculum.

Tuan, (2010) argues that "the pronunciation from the speaker and the recognition from the listener have great influences on the quality of communication for both of the parties"

(p. 540). Egwuougu (2012) expressed that for meaningful communication speaker as well as listener should have awareness about the phonemic knowledge, construction of words, and sentence structure along with interpretation of meaning in the target language (p. 213). Pronunciation must be taught accurately so that it should be understood clearly for intelligible communication (Akram & Qureshi, 2012). Levis (2007) suggested that the door to identify the general pronunciation for learners should be opened and the other door of some remarkable nonnative errors should be closed.

Rahbar, Jahandar and Khodabandehlou (2013) interpret that as for as teaching of English language is concerned, there is not enough time and practice given to listening, oral drills and pronunciation in Iran. Some of the Iranian English teachers make little attempt to teach pronunciation (Tonekaboni & Samaei, 2015). Most of the teachers do not provide instructions at all. In many EFL classrooms little attention is paid to teaching pronunciation. Just vocabulary and grammar have always been remained under greater focus and attention. They further explore that after years of studying of English language, Iranian learners lack sufficient capability of this language and it means that something important is missing in educational system about teaching of English language.

Shoostari, Mehrabi and Mousavinia (2013) also concluded that in Iran pronunciation is not focused by the teachers in language learning classrooms and teachers do not have awareness regarding pronunciation, basic features, sound system and lack of availability of appropriate material and techniques.

In Australia, English teachers were not confident enough to teach pronunciation as they lack training and incentives, audio-visual aids (MacDonald, 2002). Additionally, studies

done by Yeats (2001) Fraser (2000) and Claire (1993) demonstrate that in Australia, ESL program does not cope with the learners needs regarding their pronunciation difficulties and teachers try to avoid teaching pronunciation just because they lack of confidence and do not have sufficient knowledge and expertise to teach pronunciation. MacDonald (2002) interprets that pronunciation was not included in curriculum as well as there was not any assessment to evaluate this ability. In Canada, 67% English teachers told that they were not given training in pronunciation (Breitreutz, Derwing & Rossiter, 2001). All other language skills are being investigated without focusing on pronunciation (Baker, & Murphy, 2011; Benzies, 2013).

Similarly, in Finland, learners who get admission in universities had pronunciation problems because they did not know the English phonemes, symbols and sounds (IPA) (Tergujeff, 2013). Zhang and Yin (2009) state that sometimes learners adopt habitual pronunciation errors and they generate their own variety of pronunciation. Because of poor pronunciation, words are pronounced wrongly and cause understanding problems to the listener. Researches indicate that the correct pronunciation have positive effects on speaking.

Morley (1991) expresses that learning a foreign language without pronunciation skill, means that the learner has very limited ability for communication and they (learners) are encountered difficult situation because of not having mastery and command over pronunciation. Although, this is a technical facet, many text writers never tried to write any text about pronunciation, thinking that their struggle will not be appreciated. Since, pronunciation is the most significant component of spoken language and it affects the

learner's competence and performance to the greater extent (Tonekaboni & Samaei, 2015).

Levy, Blin, Siskin, and Takeuchi (2011) identify that although, pronunciation is very important element of successful communication, and the ultimate goal of language learning is communication. "One of the key requirements for language proficiency is to secure understandable pronunciation for the language learners" (Gilakjani, 2012, p. 119). Currently this trend has been prevailing that professionals should empowered the learners of effective English speaking. For this purpose, there has been a constant effort to teach pronunciation (Luchini, 2005).

Patil, (2008) drew conclusion that wrong pronunciation is more perplexing situation rather than grammatical mistakes (in speech). He points out that if a foreign learner says, "I TV watch" or I watch TV"; "I have two book" or "I have two books" or "This is a girl beautiful" or "This is a beautiful girl", in these cases, communication is understood somehow. Moreover, there would be a serious communication problem when a Vietnamese learner tries to say that he is going to dine, instead he says that he is going to die. In another example, a Japanese learner tries to say he has gotten just two books instead he states that has gotten just two bucks and Arab learner wants to say that he bought a pear but he says that he bought a bear.

Pronunciation is neglected and treated like an orphan, no effort is done or any opportunity is given to this sub-skill of language to be flourished in teaching English as a second/foreign language. In short, pronunciation despite being very basic and important skill is not given attention and remained neglected in the English language learning

classrooms. Other language skills i.e. reading, writing, spelling, vocabulary and grammar are focused and emphasized but pronunciation is paid least attention.

1.1.2 Status of English Language Teaching in Pakistan

There is too much demand of English by Pakistani learners, parents and employers. Rahman (2004) explains that although knowledge of English teachers both from private or public sector is not satisfactory, yet parents want their children should be taught English at all level despite this fact that researches showed preference in favor of mother tongue at initial stages of language learning process.

A recent report of compiling data from five countries by Euromonitor International is that a large portion of the population in both the courtiers (Pakistan and Nigeria) shows huge gaps between professionals having high salary packages and the rest of the people with low incomes. This stimulates the community to seek English language in upgrading the standard of their economic condition and to compete the salaried professionals. “A skilled work force with English speaking abilities is one of developing world’s economic advantages” (Singh, 2014, p. 22). Akram and Mahmood (2007) argue that the upper class, people of high qualification and people who like western culture, adopt English language in their discussion. It is used in the offices; picnic parties and conversations and it is also used as a complementary language.

In Pakistan, there is too much demand of qualified and competent EL teachers. Prosperity and well-being of the family is interlinked with English language teaching and learning. That is why, if a person is competent and proficient user of English language, s/he has

more and better chances for getting lucrative and valuable jobs. “English language is one of the important factors for progress educationally, socially and economically in Pakistan. It serves as a gateway to success, to further education and to white collar jobs” (Ahmed & Rao, 2012, p. 95). English is preferred choice for majority of Pakistani teachers and learners approximately 78% for studying abroad and 63% for white collar jobs (Mansoor, 2004, p. 359).

However, there are many so-called English medium institutions, schools, colleges and academies by which naïve parents are duped with the slogans of English medium. While, in fact there is no little chance to acquire competence of this language except repetition of some selected phrases and sentences spoken by the teachers in the classrooms. In such institutions, just reading and writing are focused and emphasized while speaking and pronunciation are not part of the curriculum or syllabi at any level neither in government schools nor in private systems.

The growing expansion of English language shows that the number of non-native speakers will be more than its native speakers in next few years and this phenomenon is more concerning for all developing territories of the world including Pakistan. English was introduced in Pakistan when this state was under the British Rule in the nineteenth century. At that time, English was considered the language of the domains of power such as government, bureaucracy, judiciary, military, education, commerce, media etc. and it also became the reserve of the elite and the means of empowerment of the ruling class (Rahman, 2009). Again, Rahman discusses the present situation regarding the importance of English language in Pakistan and states:

> English is still the key for good future; a future with human dignity if not public deference; a future with material comfort if not prosperity; a future with that modicum of security, human rights and recognition, which all human beings desire. So, irrespective of what the state provides, parents are willing to part with scarce cash to buy their children such a future (Rahman, 2005, p. 24).

Zubaidi (2014) signifies that English language has become the world's most important device for proper messaging. However, teaching of English Language in Pakistan has prevailed in the society and dominated the people under its parasol. Johnston (2003) denoted that it is considered a valuable profession. English speaking peoples launched universities and other professional institutions of education in most of the Third World countries and the Anglo-American alliance consistently proved as eminent blessings and richness (Thirumalai, 2003).

1.1.3 Government (of Pakistan) Policy Regarding ELT

In Pakistan, regarding teaching of English subject, National Curriculum (2006) includes pronunciation skill among other different language competencies and pronunciation falls under the competence of formal and lexical aspect of English language competence level 4. Although, it has been written in curriculum of grade 1-V recognition and articulation of the sounds whereas in grade VI-X the main emphasize is given on stress and intonation (Figure 1.1).

Competency 4: Formal and Lexical Aspects of Language. (C4)
Standard 1, Pronunciation: All students will understand and articulate widely acceptable pronunciation, **stress** and intonation patterns of the English language for improved communication. (C4, S1)

Benchmarks

	Grades I - II	Grades III - V	Grades VI - VIII	Grades IX - X	Grades XI-XII
BM 1	Recognize and articulate the basic sounds and **sound patterns** of English language at word and sentence level.	Recognize and articulate **sound patterns** and **stress** in words; and basic intonation patterns in statements and questions as they occur in classroom texts.	Pronounce (acceptably) words, identify and apply **stress** shift and intonation patterns for communicating different meanings.	Pronounce (acceptably) new words, and use appropriate **stress** and intonation pattern in sustained speech to communicate effectively.	Pronounce (acceptably) new **lexical items**, and use appropriate **stress** and intonation pattern in sustained speech to communicate effectively.

Competency 4: Formal and Lexical Aspects of Language (C4)
Standard 2, Vocabulary: All students will enhance vocabulary for effective communication. (C4, S2)

Benchmarks

	Grades I - II	Grades III - V	Grades VI - VIII	Grades IX - X	Grades XI-XII
BM 1	Recognize and use with correct spellings naming, action and describing words, **cognates**, rhymes, common phrases and **formulaic** expressions from immediate surroundings and from the subject texts.	Build vocabulary through simple **affixes**, **compound words**, converting parts of speech, classify words into different categories; and use with correct spellings, the vocabulary from the subject texts and extended environment including media.	Build vocabulary through **word roots**, **contextual clues**, dictionary, thesaurus, and the environment; use words, phrases and idioms in **context** and with correct spellings.	Analyze different kind of texts to identify how **lexical items** are used to convey different meanings; use **lexical items** in **context** and with correct spellings; use **lexical items** to show different meanings in their own speech and writing.	Evaluate different kind of texts to understand how **lexical items** change meaning and **style**; use **lexical items** to show finer shades of meaning and **style** in their own speech and writing.

Figure 1.1 Screenshot: Inclusion of pronunciation in National Curriculum (2006, p. 15)

On the other hand, no activity is performed practically to teach segmental and suprasegmental features of pronunciation neither at middle nor at secondary level (Majoka, Khan, & Khan, 2016). The actual situation is evidenced by an empirical study Ghulamullah and Hamza, (2017) that almost majority of the teachers were exhibited having no awareness in recognition of the pronunciation sounds and symbols. Therefore, one can imagine this fact; if teachers do not know the basics of pronunciation skill, how can they teach pronunciation and its advanced feature i.e. stress and intonation to their learners. Different studies show that Pakistani learners have segmental and suprasgegmental problems (Hashmi, 2012); Khan & Qadir, 2012; Sheikh, 2012).

Therefore, inclusion of pronunciation skill in curriculum of grade 1-XII does not mean that Pakistani learners have awareness about pronunciation skill.

Nevertheless, Ahmad and Rao (2012) assert that currently in Pakistan, the more awareness can be seen by stakeholders to get communicative competence for the English language learners. The concerning educational authorities and federal government both are adopting generally positive attitude towards education and the teaching of English especially. In fact, in Pakistani context, communicative competence means speaking ability without improving pronunciation skill and because of this deficiency; it becomes very difficult for learners to communicate confidently in a purposeful way. Recently, in Pakistan, English language is also given growing attention by some non-government organization (NGOs) such as Punjab Education and English Language Initiative (PEELI) (British Council, 2014), Pakistan English Language Teachers Association (PELTA), (Coleman, 2010), English for Teaching: Teaching for English (ETTE) are very good examples regarding awareness and promotion of English language.

In short, as speaking is the most important feature of any language, and in speaking, pronunciation plays a vital role in learning a foreign language but this feature has always been neglected in language classroom and Pakistani curriculum and syllabi do not depict any portrait regarding pronunciation because it is assumed that this skill would be developed implicitly through reading and writing and there is no need to pay attention on developing this basic skill separately.

1.1.4 Pedagogical Issues Regarding Pronunciation

Khan (2011) denotes that unfortunately the manner by which English language is taught to our Pakistani learners, is useless, beyond getting any significant outcomes and learners are unable to communicate in their everyday life. According to him the main source of learning English language in Pakistan, is school classroom where nothing is done except boring drilling of spelling and repetitions of some grammatical structures where learners feel themselves inhabitants of an alien world. Habib (2008) adds that pronunciation has impact on someone's self-esteem and confidence to a greater level regarding understandable speech; nevertheless, it is the most ignored and isolated field of ELT in Pakistan. Coleman (2010) reported that "the teaching of English in government schools is highly ritualized" (p. 16). So, as a result, our learners develop poor pronunciation and they have to face much trouble and difficulty during conversation. It must be focused at initial level as standardized pronunciation enhances the understanding and quality of communication abilities (Javed & Ahmad, 2014).

Coleman (2010) speculates that in Pakistani context, no any effective language teaching method is used. Oral skills may affect the job opportunities of learners but there is no contribution regarding educational careers of learners, rather there is possibility of getting opposite outcomes (making them impaired language users of English). English is taught as an abstract system (grammar); even this abstract structure deals with the basic components of phonetics, phonology, morphology, syntax and semantics. If it is taught properly as an abstract system and these five aspects could be measured significantly then it could be said that a praiseworthy task is being done but regrettably, that is not also the real situation even teachers are not aware of this broader idea of English language

teaching (Khan, 2011). Vocabulary, grammar, receptive skills reading and writing are focused while, productive skills listening, speaking and pronunciation are ignored at every level in Pakistan (Harmer, 2001).

Due to this reason, it is argued that in ESL situation, ELT teachers must mainly pay specific attention to teach the basic language features that enhance local acceptability and intelligibility in foreign context. It necessitates that there should be focus on the areas related to pronunciation especially the phonemic sounds and the prosodic features as well as emergent issues in pronunciation in relation to EIL should also be taught. (Egwuougu, 2012).

1.1.5. English Language Teacher and Pronunciation

In Pakistan, teachers are always overburdened due to the fact they never think to be friendly and flexible during the class. There is a wide variety of the syllabus and classes are overcrowded. They are given a wide variety of the syllabus that must be completed within specific time span. Yaqub (2009) highlights that the foundational period for teaching of English in schools is in the custody of teachers who do not know English sufficiently and who are not aware of latest and far reaching development in methodology of English. Furthermore, government school teachers prefer to cling firmly to their old methodologies in the whole professional career.

In fact, in the old teaching methodologies, there is no place for teaching of pronunciation skill. For example, Grammar Translation Method, emphasizes only on reading and

translation of text and does not focus on oral ability such as speaking and pronunciation. Many researchers (Mahmood & Gani, 2012; Ahmad, Khan & Munir, 2013; Shamim, 2011; Taveeno, 2011) have the notion that Grammar Translation method is the main problem that caused communication barriers. Since the purpose is to pass the exam rather than to get competence in oral skill including pronunciation. So, Grammar Translation Method (GTM) is considered the only guarantee to teach language and make the learners to be able to pass the subject and that is all. However, importance of GTM can't be denied in language teaching because it is very simple, (Aqel, 2013) economical in both time and monetary terms, feasible and approachable in Pakistani context along with providing the learner a conceptual depth via mother tongue of the learner. Furthermore, it has been serving the nations throughout the history. That is why; it does not seem realistic to blame solely to GTM for language problems in regard to pronunciation particularly.

Teachers teach this way because they themselves are taught in the same way by their own teachers without pondering over the new methodologies, approaches and challenges. Therefore, they would employ the strategies and activities which they already know. A language teacher must be more relaxed and, generally, he should have more friendly relationship with his learners and latest and up dated knowledge to deal with an advanced and progressive nature of language teaching methodology as compared to other subjects: mathematics, history, science and chemistry. As Kumar (2013) analyzed that, many English teachers have not awareness of any objective of language teaching. However, as far as pronunciation skill is concerned, majority of the teachers are not qualified and experienced according to the demand of this necessary element. No refresher courses or

workshops are conducted to realize the importance of this neglected field. In Pakistan, English teachers prefer to teach English language in native languages such as Urdu, Sindhi, Pashto, Saraiki etc. That is why, no skill is developed when learners never heard their teacher to teach or speak in English language.

A consultant of British Council Commission, Hywel Coleman visited Pakistan in 2010 and reported that English teachers, especially in government schools, are not skilled enough and they teach English language in Urdu because they do not have confidence in their own proficiency of English language. Bashiruddin and Qayyum (2014) argued that 89% English teachers do not have standardized qualification in English language teaching. Taveeno, (2011) conducted a study on "Challenges in Teaching and Learning of English at Secondary Level" and he found that teachers are not supported by additional trainings and refresher courses. Particularly, the trend of English language teaching courses is very scarce and English is taught as a subject not as a language. Furthermore, he continued that they are not provided special guidance regarding syllabi change despite of the fact that the teachers had more than 11 years teaching experience in ELT.

Ahmad, Barki and Yasin (2015) point out that there is insufficient knowledge and lack of awareness regarding teaching of L2 English learners' pronunciation in Pakistan. Whereas, Awan et al. (2016) indicate that our school going learners are involved in listening and reading the words with wrong pronunciation since their childhood and this wrong learnt vocabulary is regarded as standardized pronunciation. They further discuss that the learners learn language from their surrounding especially by the teachers, while their teachers never thought to consult dictionary to make correction of their wrong pronunciation and they do not have basic knowledge regarding phonetic symbols. Nawab

(2012) explains that teachers teach their learners through translation and reading and other activities regarding developing oral skills are not emphasized. Howlader (2010) suggested that among other post-colonial countries, teaching of pronunciation is more required phenomenon in Pakistan because of its local needs.

Additionally, just translation of text and reading are focused while speaking skill is ignored in a classroom. Chandio et al. (2013) indicate that the most active participant in a classroom is only a teacher and he is supposed to perform all classroom related activities while learners remain busy in listening lectures, note taking, copying blackboard, and keep silent throughout all the time.

Khan (2011) elaborates that there is nothing done except laborious drilling or cramming of vocabulary in the shape of learning. Just cramming of boring English spellings with grammatical rules and concise definitions is carried out by which learners find themselves entangled by a deserted island (subject) of English language beyond real life exposure. "Our school learning system does not make learning interesting or a pleasure. On the contrary, it tortures our children endlessly" (Patil, 2008, p. 229).

In fact, it is not easy task to teach English language for the non-native speakers (teachers) (Taveeno, 2011). They do not have familiarity with the English phonetic system, segmental or suprasegmental features, resulting most of the teachers are not having good command over basic components of English language. In addition, Pakistani teachers are not native speakers and they do not study to get knowledge how to teach English (Khan, 2011). Similarly, Chatterjee and Jain (2011) also point out that it becomes very crucial

for (non-native) speaker to have some particular and accurate knowledge of pronunciation to be understandable for his/her listener.

Fraser (2001) suggested that language teacher has significant role in teaching pronunciation and teacher must have better insight to express the concepts clearly. Teacher should have awareness of different learning styles and different background knowledge of his or her learners. She went on to say, teacher should employ his/her energy, so that learners enhance their pronunciation skill in a better way. This approach calls for "metalinguistics communication" a type of communication which is performed between teacher and learners about pronunciation. For instance, if learner does mistakes and teacher points out learner's mistake by suggesting some option in which learner improve their pronunciation along with the strategy of trial and error (p. 35).

1.1.6 Pakistani Learners' Lack of Confidence

It is very alarming situation for Pakistani learners that they cannot speak English properly even after the studies of years of English language (Jabeen, 2013). Pakistani learners are not provided exposure for communicative feature of language learning and as a result, learners have problems with oral skill even those learners who have very good academic career. Such learners, when they are exposed to native context (migrating to native countries of English language for job or studies) they feel much hesitation and embarrassment because of their poor pronunciation. As Derwing, Rossiter and Munrol (2002) point out that accurate pronunciation accelerates the individuals' social status and

because of foreign accent speaking one person could be prey for humiliation by native speakers.

Bilal, Tariq, Rashid, Adnan and Abbas (2013) add that the condition of speaking skill of the learners is miserable even bright learners who get good grades in English in written examination but they cannot speak English language accurately because of poor pronunciation and it is always neglected in language learning classroom. Neither teachers nor any stakeholder tries to pay attention on this very basic skill of English language. Having no exposure of pronunciation training, they have incorrect pronunciation because of poor listening and speaking skill (Rahman, 2010).

Furthermore, Pakistani learners who go abroad for academic purpose, although, they pass the language screening tests somehow and are permitted to sit in the class, but they are entangled into a totally new exposure of English medium schools, where everything, i.e. lectures, instructional material, classroom discussion, assessment and evaluation are in English. They (learners) cannot understand their teachers as well as their peers. Therefore, they remain silent and baffled in an unfamiliar world (Rauf & Iqbal, 2008).

Gilbert (2008) highlights that our sense of self and community are tied with the speech rhythm of L1. These rhythms are acquired in the first year of life and have profound bases in the minds of learners. That is why; it is natural for the learners to have feeling of anxiety while speaking a second language. Although, it is happened unconsciously however, it plays as major hindrance to improve intelligibility in second language learning.

They have feeling of insecurity and inferiority when they are unable to speak English in the target language (in native exposure). In most cases, such learners are overwhelmed by great psychological stress and anxiety (Rauf & Iqbal, 2008). The reason behind this lacking is that most of the teachers emphasize and focus on rote learning and they never try to provide exposure to their learners for practice of speaking or pronunciation skill. The main goal is to pass the subject of language by memorizing some translation paragraphs, specific lessons, essays, letters and applications along with learning of some grammatical rules. In rural areas, graduates do not have required competence of oral skills because they are not involved in language development activities (Nawab, 2012).

Actually, in Pakistani context the purpose of teaching is just information and knowledge about language that is gobbled up by the learners without digesting and imprinting any sign of positive change. Pakistani learners are passive and totally inactive in classroom and they feel shy and hesitate to speak English before their teacher and other school mates (Nawab, 2012). As these learners are accustomed of spoon-feeding methods, they never develop thinking power, so they seldom ask questions about any problem or query due to restricted classroom environment. They have no freedom of thought.

Patil (2008) proposed some techniques, to cope with the challenge of learners' nervousness, fear and encourage them to express, read and write English fluently. For example, role play activities, information gap tasks, brain storming exercises, riddles, puzzles, cartoons, anecdotes, jokes, songs, and other low cost and easily available teaching materials come handy. Learners enjoy toying with the language, experimenting with it and gradually but surely feel confident and comfortable with the language. Once they have got rid of fear complex, they try to use English creatively (p. 239).

1.1.7 Lack of Oral Practice

Yaqub (2009) elaborates that the examination system derives teachers to employ a specific methodology in the classroom. If a student has good memory and s/he can cram the information in a better way, that student is very fit in the examination system and he would be successful, get good grades in all subjects without getting any command over speaking/pronunciation.

Additionally, the examination system does not compatible with the latest teaching techniques. Teachers prepare their learners according to the examination point of view, keeping in mind the predictable questions in the exams (Nawab, 2012). Nawab (2012) interprets that passing through such situations, the learners come out from school with no language skills satisfactorily. He went on to say that when they acquire higher and advanced studies and they are deficient in other skills such as reading and writing. This deficiency (in reading & writing) is compensated somehow with further exposure of educational environment but deficiency in speaking and listening remains throughout the individual's life, by making impaired career, misfit for lucrative jobs, creating many other obstacles just because of the deficiency in English language.

Our examination system has no any connection with the spoken skill because there is no place in examinations related to oral skills (Bilal, et al., 2013). Demirezen (2010) high lights that learning a language does not mean to pour the information and knowledge (into the minds of the learners) instead it is a dynamic acquisition of communicative capabilities. In this approach teacher can encourage the learners to use target language effectively, fluently and appropriately learners are more involved in student-centered approach contradicting the traditionally teacher-centered approach (Demirezen, 2010).

This examination system adds fuel to the fire when it encourages learners towards rote learning and it promotes rote learning (Chandio, Khan & Samiullah, 2013). This philosophy develops the *banking concept of education* given by Freire (1970) in which teacher's task is just to transmit the knowledge and information into the minds of the learners as people deposit the money and withdraw from the bank. Learners have to withdraw or reproduce that knowledge in the exams as it was deposited in their minds without any productive outcomes. There are no assessment or pronunciation tests, so no need is felt by the teachers or stakeholders to spend time on teaching pronunciation and teachers want to go ahead in language teaching without pronunciation. Zubaidi (2014) conducted a study in Arab context and supports this idea by saying that examination system drives the learners towards rote learning instead of testing their analytical and creative skills. They learn lessons, reproduced them in the examination halls and forget all the stuff someday itself because after exams it was never reutilized in real life situation.

Kamyab (2008) adds that the purpose is just to pass the exams. Learners are taught according to the examination point of view rather than being taught to improve their oral abilities and pronunciation. Only those skills are emphasized which are assessed in the exams for instance, grammar, vocabulary, writing and reading. Pronunciation is very important language sub-skill of speaking. However, it is ignored throughout the academic in Pakistan and that is why, learners have lack of communicative competence as they feel hesitation, lack of confidence and mispronunciation.

1.1.8 Local Textbooks and Omission of Pronunciation Skill

Although local books are taught in all the government schools, yet some private schools prefer Oxford and Cambridge's books. Rahman (2004) denotes that the institutions for upper class utilize the text books written by the native people of English language and these books include very fantastic pictures and innovative exercises. In these institutions, learners are exposed to real life situations and extra-curricular activities and they are tested and they polish their skills in English language. He mentions that although, apart from text books there are some other factors through which they learn English i.e. their friends, families, using computer, T.V., media, songs and reading material in English are also main factors, whereas children of poor class have no access on these resources. It indicates that their grief is manifold, they are not only denied of basic facilities in schools but also they are deprived of a luxurious and comfortable academic life at home. The local text books do not cope with the modern demands and they lack the appropriate subject matter. These books do not provide deep knowledge and, they have many spelling and grammar mistakes too. Nawab (2012) and Warsi (2004) also mention the same point of view that local available textbooks do not have sufficient material to cope with the learners' linguistic demand of pronunciation.

It is also true that if foreign books are employed in government schools, teachers are not so qualified to understand those books. On the other hand, in some of so-called private institutions where foreign books are taught, teachers use old methodologies to teach the student with no good results. For instance, there are some books written by native English speakers such as "Step Ahead", "Progressive English", "Oxford Reading Circle" these books contain CDs and one can find a lot of activities regarding four skills of English

language including speaking and pronunciation, nevertheless, teachers do not have expertise and time to manage all those activities especially the spoken feature is treated badly like Cinderella and it falls a victim of negligence because this skill is not tested or examined in the summative assessment. The traditional pronunciation teaching method of aural-oral approach does not meet the required targets because it figured out the passive and dependent learners who cannot do anything except imitating the different sounds without clear perception would gain oral skills implicitly (Por & Fong, 2013).

1.1.9 Non-Availability of Language Laboratories and AV-aids

Pakistani public schools are deprived of learning resources especially the typical rural public schools have even worst conditions. These schools not only lack the facilities: language lab, digital equipment and other related audiovisual aids but also learners are also deprived of necessities of life as drinking water, availability of bathrooms, no chairs and desks in classrooms, untidy environment of school premises.

> The dropout rate is alarmingly high at the primary level; consequently, it is revealed by the Data Center of UNESCO, that 33.8% females and 47.18% in males could pass through the most initial level of education. We may be conclusive about the ground reality that people in the 6th largest country of the world have no access to the basic education even (Rashid & Mukhtar, 2012, p. 334).

However, Taveeno (2011) found in his study that the majority of the schools were having their libraries but without facilitating them English newspapers, computers and audio-

visual aids. Egwuougu (2012) discussed the situation about the Nigerian Junior Secondary Schools regarding English language learning and teaching of pronunciation and states that mostly of the schools have no materials such as televisions, radios, tape recorders, CDs, earphones, microphones, cubic mirror etc. are supplied (p. 4). He further emphasized that government should take responsibility to manage all the relevant material and administration of the schools should maintain those facilities by utilizing proper way.

1.1.10 Differences Between Urdu and English Pronunciation Systems

There is difference between the sounds of English and Urdu orthography and the recognition of speech sounds. Usually, Urdu alphabet/letters produce one sound, whereas, English alphabet/letters produce more than one sound. For example, English 'c' letter produces three sounds, as 'ch', 'k' and 'sh' (Khan, 2011). That is why, it could be said that without any particular training or instructions to get mastery over phonological awareness is very difficult for the learner of English language because of the analogy of the English sounds which demotivates the learner and proved as a barrier rather than supporting them. There are 37 consonants and 10 vowels in Urdu (Kachru, 2003), however, English language has 24 consonants and 20 vowels. Majority of the Pakistani learners, has difficulty in identification of two different sound systems. For example, in Urdu there are some phonemes as /ث، س، ص/. On the contrary, there is only sound of /s/ in English and these three Urdu phonemic sounds are uttered different blockage rate of air between teeth. That is the reason, that hissing sound of /s/ is not pronounced properly (Ghulamullah & Hamzah, 2017). There are some more languages in Pakistan for

instance, Punjabi, Pashto, Sindhi and Bengali having different manners and articulation of the phonemic sounds (Khalique, 2006).

Furthermore, there is the difference in stress pattern. Pakistani speakers of English are unaware of focusing on stress pattern of English speech. For example, they pronounce the words "comfortable" and "permanent" (Akram & Qureshi, 2012) comfortable /kʌmfəteibəl/ instead of /kʌmfətəbl/, permanent /pʌrmɑːnent/ instead of /pɜːmənent/and they do not shorten the unstressed vowels. Apart from this,triphthongs also cause problems for the non-native speakers especially for Pakistani learners (p. 45-46).

Moreover, English language is a stress-timed language while other languages are mostly syllable-timed (Gilakjani, 2012). In English language, one or two syllables are stressed while rest of the word or sentence is not stressed. That is why, for most of L2learners, English sounds remained unclear. Gilakjani (2012) states that in this situation very comprehensive knowledge is required to deal with such problems and little knowledge of the teacher might be risky that may misguide the learners. Esmail, Ahmed and Noreen (2015) point out another reason that the hindrance in getting accurate pronunciation is Urdu orthography especially teaching of some sounds that are not pronounced well by Pakistani learners, like omission of schwa sound, pronouncing of aspirated sounds of /p/, /t/, /k/. Majority of the Pakistani learners do not utter aspirated sounds such as /p t k/, they pronounce these sounds like their L1 sounds without allophonic awareness (Syed, Ansari & Gopang, 2017).

1.1.11 The Usage of Computer in ELT Context

There is no doubt that modern technology has made this world a dreamy terrain. Now world is just a click away. We have very easy access to know all about science, technology, business, arts, politics, culture, space, solar system etcetera and education is no exception. Hua (2006) indicates that with the assistance of computer programs learners find boundless options of selecting material and getting extra support by the system.

In the developed countries, computers are being used for language learning context. Haider (2013) denotes that different terminology such as CAI (Computer-Assisted Instruction), ICALL (Intelligent Computer-Assisted Language Learning), CELL (Computer-Enhanced Language Learning) and TELL (Technology-Enhanced Language Learning) is used to relate the combination of computer and English Language Teaching (ELT) and one of them mostly described term is Computer-Assisted Language Learning (CALL). It is apparently clear that CALL is being used more rapidly in schools because of numerous benefits (Haider, 2013, p. 205).

Tanner and Landon (2009) assert that teachers and learners take much interest in CALL because it grants individual's coaching and prompt feedback on the correctness of a learner's response to computerized tasks. "Computer Assisted Language Learning (CALL) is a technique for using technology in the field of language learning" (Molenda, & Januszewski, 2008, p. 34). CALL technology assisted language learning classroom. By using CALL, learners may demonstrate better performance in less time in school premises with focusing on global learning environment (Almekhlafi, 2006). Teaching and

learning language could be more practical by employing computer-aided instructions (Sheingold & Hadley, 1990; Warschauer, 2000). This popularity of CALL program prompted many researchers and scholars to conduct CALL related researches (Gulbahar, 2007; Anderson & Maninger, 2007; Zhao, 2007; Judson, 2006; Bauer & Kenton, 2005).

Liu et al. (2002) express that the implication of speech recognition software in ESL classrooms is that a student's oral abilities can be grammatically analyzed to assess oral proficiency levels and to bestow the learners with corrective response. Dunkel (1991) asserts that the using computer technology as a tool could include increasing language learners' self-confidence, vocational awareness, language proficiency, and overall academic skills. Bergstron (2007) states that CALL encompasses four different areas of research; psychology, computer science, linguistics and pedagogy. CALL comes from the discipline language learning and applied linguistics. Lee (2000) expresses that the recent shift to the global information-based economies means that learners will need to learn how to deal with large amounts of information and have to be able to communicate across languages and cultures.

Lee (2008) interprets that the usage of computer for English pronunciation learning supplies the prompt feedback to learners as compared to human instructor' s limitation in regard to patience and (frequent) availability. Neri, Cucchiarinin and Strik (2002) have the opinion that "Technology offers for practicing oral skills and addressing pronunciation problems, two areas that are hard to improve within traditional class-based settings" (p. 40). Additionally, the use of computer for pronunciation teaching makes a

learner to some extent an autonomous who becomes responsible for his/her own learning and get awareness of his/her own deficiencies and drawbacks.

Chapelle (2003) states that teachers need to learn using computer for teaching material and need to hold novel teaching strategies using the technology. Pronunciation plays a vital role in communication. Actually, teaching of phonemic sounds is a novel idea in Pakistani context. Again, combination of computer–assisted language learning (CALL) especially the pronunciation is also very rare. Majority of the teachers use traditional methods of language teaching without paying attention on pronunciation, vowel and consonant sounds. Liu and Hung point out that "it is imperative to conduct a study investigating the pedagogical effectiveness of applying computer assisted pronunciation instruction to improve their pronunciation quality" (Liu & Hung, 2016, p. 1940).

However, Rahman (2004) indicated that one problem could be realized that the computer generates the illusion of speed and power like a magic. It could be difficult to anticipate that old and traditional methods of creating knowledge, beauty and relationship, will be ridiculed by new generation or there would be a generation gap because of computer. However, this fact is clear that a fundamental change has been occurred regarding awareness of knowledge in Pakistan. He continues to say that computer programs in English increase the power of the affluent class. He continues to say, it strengthened the Centre America and the West with propagating its language along with cultural values and control over all the matters, and there would be an emergence of a computerized society.

In fact, Rahman (2004) wrote this book 14 years ago; however, now circumstances have been changed dramatically especially in regard to technological changes in the last two decades. Smart phones and even handy laptops are available in the market on very reasonable price. Furthermore, now government in government schools is also facilitating the learners with computers or laptops to bright learners at university level as well as many other cash incentives are also given to those learner s who get distinctions in Board exams. Now they are much facilitated regarding using technology as compared to last two decades.

Computer assisted language learning (CALL) provides the learners a stress-free environment. Since mispronunciation causes a lot of communication drawbacks because of hesitation and learners feel shyness. In this regard, computer could be better option to cope with the pronunciation problems. Learners can learn native-like pronunciation, they can do practice again and again without making their teachers exhausted. They can imitate speakers by observing their mouth position. When they would listen native English speakers by watching phonetic videos they would feel confident and try to speak English with accurate pronunciation. "CALL is not shorthand for „the use of technology" but designates a dynamic complex in which technology, theory, and pedagogy are inseparably interwoven" (Chapelle, 2009, p. 719).

Although, this fact is admitted pronunciation skill has always been neglected in language learning classrooms. However, this reality is not well-known in Pakistani context. Government policies, curriculum designers, school administrators, stake holders even teachers are not aware of importance and negligence of pronunciation skill. Very few studies have been conducted in Pakistan; nevertheless, the focus of majority of the

researchers is to identify the pronunciation problems. Very few studies proposed the solutions or remedies to cope with the pronunciation issues. Therefore, it is hoped that through this study, not only problem will be highlighted as well as there will be provision to solve this language problem.

The all above-mentioned discussion suggests that there was a dire need to conduct studies on pronunciation through CALL. So, an attempt was made through this study to investigate the effect of CALL on pronunciation at secondary school level, as more work is required in this field. Thus, the focus of this study was to find out the effect of computer assisted language learning (CALL) on pronunciation of English Language at secondary level in Pakistani Context. International Phonetic Alphabet 44 IPA phonemic sounds (Appendix A) were taught to the learners at the secondary school level. This study was limited to the teaching of all vowels (short and long sounds) and consonants (voiced and unvoiced) sounds by employing pronunciation videos and Cambridge Advanced Learner's Dictionary.

1.2 Problem Statement

Pronunciation plays a fundamental role in a successful communication and it gives the first impression of the speaker's language skills. Habib (2008) adds that poor pronunciation affects someone's level of confidence as well as it causes misunderstanding and leads to breakdowns the conversation. Ahmed (2017) states that learning English pronunciation has greater significance for learners, not only for exam purpose, but it also helps them to do communication nationally and internationally (in a

better way) with getting good career jobs in their future. Furthermore, because of (poor) pronunciation someone could be victims of social and professional discrimination (Derwing, Rossiter, & Munrol, 2002).

Actually, the pronunciation skill has much importance and should be more focused and emphasized in language learning process for better communication purpose. Good accent and pronunciation skill help second language speakers to be fluent and would be able to express his/her opinion and ideas freely in front of job interviewer without any hesitation and s/he would be given preference on those persons who do not have good and better English communication skill. Although, knowledge and expertise are more important however, good pronunciation and command over oral skills have crucial role in an individual life. Pronunciation teaching must be focused at initial level as standardized pronunciation enhances the understanding and quality of communication (Javad & Ahmed, 2014).

Pakistani learners have to face communication problems and they are not very good users of English even after spending years of studies of English language learning (Rahman, 2014; Jabeen, 2013). They mispronounce the words because of this deficiency. Both the participants; speakers as well as listeners have to face problems such as having poor pronunciation, lack of confidence, hesitation to speak English language or if they want to speak they cannot speak English in a proper way because of poor pronunciation (Hussain, 2012; Jabeen, 2013; Rahman; 2014; 2005; Chandio et al., 2013).

Ahmad, Barki and Yasin (2015) point out that there is insufficient knowledge and lack of awareness regarding teaching of L2 English learners' pronunciation in Pakistan. While,

Khan (2011) opines that in English language teaching, there is nothing done (in Pakistan) except laborious drilling or cramming of vocabulary in the shape of learning. Rauf and Iqbal (2008) denote that Pakistani learners who go abroad for academic purpose, instructional material, classroom discussion, assessment and evaluation all are in English. They further expressed that the learners are unable to understand their teachers as well as their classmates. Thus, as a result they remain silent and baffled in an alien world.

In Pakistan, particularly in rural areas, not only the secondary school learners but also the graduates do not have any command over oral skills because they are not exposed to language development activities and English teachers prefer to teach English language in native languages such as Urdu, Sindhi, Pashto, Saraiki (Nawab, 2012). That is why, there is nothing regarding developing oral skill (speaking or pronunciation) as learners never heard their teachers to teach or speak in English language. Nation and Newton (2009) signify that "When some teachers and students complain about difficulties in speaking, they are often talking about pronunciation" (p. 75).

Majority of Pakistani teachers does not have command over pronunciation and they lack sufficient knowledge of pronunciation sounds (Ghulamullah & Hamza, 2017; Malghani & Bano, 2014; Rehman, Khan & Bukhari, 2012)). That is why, they cannot teach pronunciation to their learners properly and as a result, this important and very basic skill of pronunciation remained is neglected in all the learning procedure.

Teachers should get awareness on sound patterns along with perception of different variation in pronunciation (Line, 2014). Yaqub (2009) interprets that the foundational period for teaching of English in schools is in the custody of teachers who do not know

English sufficiently and who are not aware of the latest and far reaching development in methodology of English language teaching. Keeping all these above-mentioned aspects in view, the issues regarding pronunciation, computer technology may provide a better solution as compared to the prevailed traditional methods for language learning and teaching.

Although, the usage of computer in Pakistan is prevailing rapidly in every walk of life throughout the country. However, its usage is very limited. The trend of using computer in the public schools is just limited to the labs where old models of dusty computers are kept and there is no availability of computer teachers to teach the learners some basics of computer education. "Computers can provide individualized instruction, frequent practice through listening discrimination and focused repetition exercises, and automatic visual support that demonstrates to learners how closely their own pronunciation approximates model utterances" (Levis, 2007, p. 184). In addition, this device (computer) offers the ELT learners plenty of material and native environment such as native models of conversations, dialogues, interviews as well as nonverbal specimen, i. e., body language, eye contact, facial expressions, gestures with native dialect and accent. All these activities would also be helpful to maintain the standardized pronunciation.

Again, through this study, the ELT teachers would be able to get awareness of pronunciation variations, language variety and difficulties in learning standardized English articulation by watching phonetic videos and they would be motivated to do practice of their pronunciation skill via digital dictionaries. Therefore, in this way, learners of secondary school level would have a large variety of digital option to cope with the pronunciation barriers as they feel hesitation, when they would do practice on

computer or by consulting digital dictionaries. They would imitate native models and do practice, utilize speaking dictionaries of native accent. Hopefully, their learning would be accelerated and learners would be confident enough to remove pronunciation barriers.

Teaching of pronunciation is a tough exercise. However, it can be made easier through the usage of computer by devising different techniques. As computer grants its users inclusive variety of experience to get command on pronunciation skill by imitating, practicing of native speaker models without any hesitation and without any exertion.

Hence, an attempt was made, through this study to encourage English teachers to use computer in their classrooms for teaching pronunciation and make their learners to indulge themselves in getting required outcome regarding pronunciation. It is also anticipated that the use of computer in teaching pronunciation of English language at secondary level would provide the ELT teachers as a helping tool in language learning process. Learners would become competent user of English language and overcome their pronunciation barriers by imitating native models, shown by computer to the non-native learners.

Additionally, many researches have been done on pronunciation or pronunciation teaching through computers in different contexts and perspectives. However, as far as Pakistan is concerned, this field is still vacant even no one can find a single book (in Pakistan written by Pakistani writer) about pronunciation pedagogy, particularly, about teaching of pronunciation through computer because it is not a common practice in Pakistani context. Moreover, it is the need of 21st century to meet the global need to perform such studies on such topics and conduct more and more new researches on

pronunciation and pronunciation through computer. So, it may be expected that this study would provide new understanding and would be proved as an initiative step for further studies, and researchers and writers would be encouraged to go ahead in this field according to the local needs and international demands.

Since, very few studies have been conducted in this field, and in the Pakistani context, this field is still ignored. Pronunciation has always been neglected in many language programs (Derwing, 2010). A lot of work is required to be done in this field; especially teaching of pronunciation by computer is completely a new dimension in learning and teaching of English language in Pakistan. This study in this domain would open new windows of language learning and teaching through the modern and digital device such as computer to improve the pronunciation as it is very basic skill of English language.

1.3 Objectives of the Study

Following objectives were made for this study:

1. To compare the effects of CALL and teaching pronunciation without CALL on English language learners' pronunciation in secondary school in Pakistan.

2. To examine the effects of CALL and teaching pronunciation without CALL on learning of vowel sounds of English language learners in secondary school in Pakistan.

3. To evaluate the effects of CALL and teaching pronunciation without CALL on learning of consonant sounds of English language learners in secondary school in Pakistan.

1.4 Research Questions

1. Is there significant difference between the effects of CALL and teaching pronunciation without CALL on English language learners' pronunciation in secondary school in Pakistan?

2. Is there significant difference between the effects of CALL and teaching pronunciation without CALL on English language learners 'pronunciation of vowel sounds in secondary school in Pakistan?

3. Is there significant difference between the effects of CALL and teaching pronunciation without CALL on English language learners' pronunciation of consonant sounds in secondary school in Pakistan?

1.5 Research Hypotheses

Hypotheses made for this study are inductive (observation base) hypotheses (Gay, Mills & Airasian, 2012).

H1 The secondary school English language learners who are taught through CALL are better in pronunciation than the learners who are taught without CALL in Pakistan.

H2 The secondary school English language learners who are taught through CALL are better in pronunciation of vowels sounds than the learners who are taught without CALL in Pakistan.

H3 The secondary school English language learners who are taught through CALL are better in pronunciation of consonants sounds than the learners who are taught without CALL in Pakistan.

1.6 Conceptual Framework

Conceptual framework for this research was devised on the bases underpinning the theories such as cognitive theory (Jean Piaget), socio-cultural theory (Vygotsky) and behaviorism (B.F. Skinner) theory to prove the stated hypotheses which were discussed earlier in this chapter. Since the main aim for this study was to find out the effect of CALL on pronunciation skill and to compare the CALL instruction and traditional method to improve the vowel and consonant sounds of English pronunciation.

The researcher used fundamental features of these theories. According to *cognitive* theory, when different channels of brain start work together, they perform better rather working with single channel. Donald Hebb (a neuropsychologist, 1949), exhibited the notion that "neurons that fire together wire together". Based on this notion, researcher used different devices such as computer and digital dictionary to see the effect of CALL regarding learning of IPA sounds; as learners used phonological, visual and auditory channels of the brain altogether to examine the effect of multichannel devices to enhance their pronunciation. It also promoted *metacognitive approach*; the learners started to realize the problem and took part in improving initiatively, going ahead from thinking, new methods how to improve pronunciation, to application of new suitable techniques autonomously.

Behaviorism supported the treatment plan of the current research, as learners did practice of 44 IPA phonemic sounds repeatedly by imitating the speakers of phonetic videos and using CALD. It supported the idea of comparison of among the sounds via Audio Lingual Method (ALM) presented by Behaviorism because in L2 learning procedure, problem occurs when L1 interferes with L2 due to the different L1 and L2habits or patterns of sounds. In this method, learners compare the different sounds of L1 and L2 and listen the pronunciation. There are processes of imitation and recordings of their own dialogues and speeches along with lot of drilling to make it a habitual process from controlled to automatic learning.

Similarly, the current study was idealized by *Socio-cultural* theory using the mediating role of computer (Lantolf, 1994) on secondary school English language learners in Pakistani context. As far data analysis is concerned, to compare both the groups, i.e., Experimental Group 2 and Experimental Group 1, t-test was used to examine the effect of CALL on pronunciation to see the difference of both the treatments given to experimental and control. It is based on the assumptions (Geeslin & Long, 2014) that human thinking is originated from the external social factors. The theory claims that all kinds of learning is gained by the interaction with the social setting; family, school, social groups, work places or any other assisted agents etc.

Zone of proximal development (ZPD) is a term that has been defined as “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978, p. 86). In

this research computer was used as an assisting and scaffolding agent and researcher tried to bridge the gap among different levels of ZPD, i.e., learners' current level, as they were unknown to IPA 44 phonemic sounds before the treatment. The expected level was the understanding and awareness of IPA phonemic sounds.

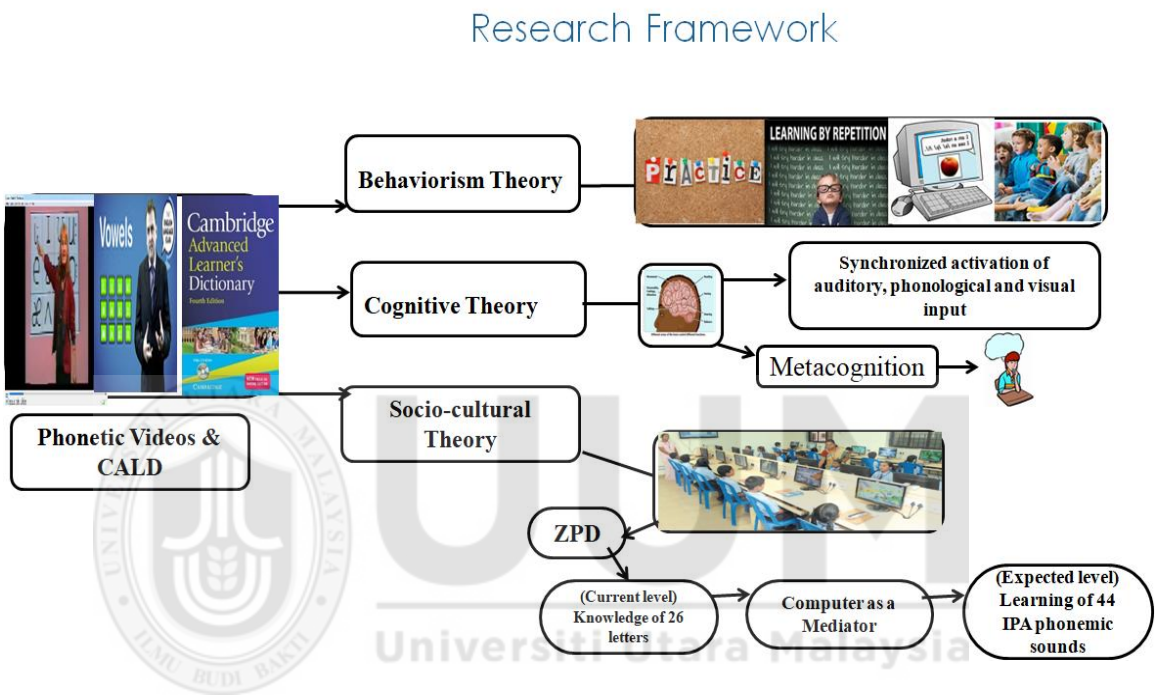


Figure 1.2 Conceptual Framework for the Current Research

Furthermore, according to this theory, symbolic tools are helpful in getting empowerment for organization and controllability of mental process and through these devices learners perform in a better way.

1.7 Significance of the Study

This study may help teachers to highlight their roles in two ways. Firstly, as majority of Pakistani teachers does not have awareness regarding pronunciation skill (Ghulamullah & Hamza, 2017), this study would help them to get awareness and they would be able to

improve their own pronunciation skill. Secondly, teachers by presenting their role as facilitators and assisting their learners to get mastery and command over pronunciation skill will be able to fill the gap of mispronunciation that exists in Pakistan. Different researchers (Celce-Mucia et al., 2006; Fraser, 2000; Gilbert, 2010; Derwing & Munro, 2005; Harmer, 2001) indicate that pronunciation teaching is ignored in English language learning process or if it is focused somehow in the class, learners get bored and frustrated by the monotonous practice of phonetic symbols and sounds. Therefore, by employing computer technology teachers can make the learning more interesting, can teach pronunciation in an enjoyable environment, and can make their learners be engrossed intentionally and happily in this tough task of getting command over pronunciation skill. Celce-Murcia et al. (2006) signify that the electronic devices supply learners an entertaining or game like learning atmosphere.

Furthermore, it is expected that through this study, learners (at school, college and university level) will be motivated as digitized academic material is more appealing rather than simple teaching methodology performed by the teachers. They could utilize computer for doing practice of segmental and suprasegmental features of pronunciation and get prompt non-judgmental feedback because of unexhausted nature of computer technology (Hua, 2006). As a result, an interactive approach would be promoted in language classrooms. Learners will do practice on computer in pair form or in group form, their academic interaction would increase and it will help learners to become initiative in the class and culture of One-man Show (teacher is performing all classroom activities) would be demolished.

Moreover, this study will also be an attempt to bridge the gap between theoretical and practical sides of using of CALL in the context of teaching of pronunciation. Policy makers might be able to set their goals, maintain pedagogical strategies and generate effective approaches to overall language learning. This study might be proved as a milestone for local researchers to open new vistas of knowledge regarding CALL programs among users of CALL and the software providers of CALL; they could generate new pronunciation software to fulfill the needs of 21st century learners especially in Pakistani context. The distance between language learning strategies and language labs could be shortened. Language learners might be equipped with modern technologies and devices which enable them to become the proficient English language users and enhance their communicative proficiency in international and global perspectives.

In addition, the findings of this study might be serviceable for EFL/ESL curricula designers and language methodologists in developing language teaching materials to fulfill the learners' needs and demands locally as well as globally. Particularly, the findings could also be utilized by language instructors regarding pedagogical teaching of English for specific purpose (ESP) and English for academic purpose (EAP). The study would bring both the fields of CALL and ESL together and a new approach would be instigated.

Last but not least is that testing, retesting and refinement are the fundamental components of any research. Therefore, it is expected that this study might encourage other researchers to increase the number of their researches by covering different learners' levels into wide range in ESL pronunciation issues on the same topic expanding to other

the different contexts and exposures and it would be more helpful to enrich the local as well as international literature.

1.8 Operational Definitions of the Variables

Operational definitions of dependent and independent variables as discussed in the following:

Pronunciation (Dependent Variable)

This research dealt only with pronunciation skill of spoken aspect. The rest of the language skills such as reading, writing, listening, vocabulary, spelling, grammar, accuracy and fluency were not the part of this research. This study was limited to 44 IPA phonemic sounds and identification of these features of pronunciation i.e., vowel and consonant sounds whereas, the suprasegmental features; stress, rhythm and intonation were not included in this study.

CALL Program (Independent Variable)

Computer Assisted language learning program for this study consisted of five Phonetic videos as CALL program. First three videos from were shown to the participants were in female voice while the rest of the two videos 4 and 5 were in male voice. First three videos were consisted of all phonemic sounds vowels and consonants whereas, last two videos were comprised of only vowel sound, i.e., monophthongs (single sounds) and diphthongs (double sounds). Apart from this, Cambridge advanced Learner's Dictionary

was used to do more practice of all IPA sounds (vowel and consonant) used for Experimental Group 1 as additional practice. All phonetic videos were downloaded from internet. However, CALD was CDROM based software which was installed in all computers in computer lab. No online material or software was included in this research.

1.9 Definitions of the Major Terms

Phonetics

The branch of linguistics that deals with the sounds of speech and their production, combination, description, and representation by written symbols is called phonetics. Phonetics is the study of sounds of speech when (Kelly 2001) speech organs move to produce sounds, which travel in sound waves, which are received by the ears and transmitted to the brain. "It studies the physical nature of human sounds in general, irrespective of which language is being spoken" (Lodge, 2009, p. 8). Phonetics is the study of speech sounds, how sounds are made (articulatory phonetics), how they are perceived (auditory phonetics) and physics involvement is called (acoustic phonetics).

Phonology

Phonology is the study of the patterning of sounds in languages. It deals with the usage, relationships, distribution of the sounds etc. Phonology is like a "grammar" of sound for a language (Richey, 2003). However, Pennington (2014) elaborates that phonology can be defined as the study of sound patterns or as the study of pronunciation patterns of the speaker. Whereas, English phonology means description of the sounds of English and

their relationship and contrasts with each other. “Phonology is primarily concerned with how we interpret and systematize the sounds” (Kelly, 2001, p. 9).

Phonemes

A phoneme is “the smallest meaning-distinguishing unit in a language” (Gut, 2009, p. 51). Phoneme is a set of dissimilar sounds such as /p/ /b/ /d/ are three different phonemes. These sounds indicate difference in meanings of the spoken speech. For example, here is the word rat/ræt/ while if there is change in the middle phoneme as in the word the rot it is /rɒt/**,** this would be different word with different meaning. The set of phonemes comprised of two categories i.e. vowel sounds and consonant sounds. These sounds have different pronunciations based on the position of the particular sound in the word. For instance, [p t k] and [$p^h t^h k^h$] the different pronunciation sounds of ‘p’,‘t’ and ‘k’ sounds. These sounds could be aspirated [$p^h t^h k^h$] and un-aspirated [p t k] depending upon the position in the word. Such aspirated and un-aspirated sounds are called allophones. The term allophone is derived from Greek language, which means different sound **(**Radford, Atkinson, Britain, Clashen, & Spencer, 2009). Thus, allophone is defined as different sounds of a phoneme without changing the meanings of a word.

Segmental Features(Micro-level)

Celce-Murica, et al. (2006) state that the letters and sounds are not same object. We can say a sound can be heard but not seen whereas a letter is a symbol that can be shown in

written form or symbols, indicating one or more sounds. Consonants are the sounds in which the air stream gets some blockage on its way up from the lungs. Words like “big”, “map”, and “see” begin with the consonants. Nonetheless, vowels are the sounds in which the air stream shifts out very softly. Words like “apple”, “east” and “over” begin with vowels. They further indicate that every language has consonants and vowels, but no two languages have exactly the same ones.

Suprasegmental Features (Macro-level)

The suprasegmental features consist of stress, intonation, rhythm, connected speech, loudness, pitch, tone and length, quality and all these phonetic elements play vital role in English speech production and reception (Kelly, 2001; Collins & Mees, 2013; Mirza, 2015). Stress and intonation are two major components of suprasegmental feature. A brief description of both the features is given in the following.

Intonation is the variation of pitch of the voice and the pitch may be changed by the variation of frequency of vibration of the vocal cords (Knight, 2013). Kelly, (2001) interprets that intonation is going up and down in pitch while speaking. It gives clear account about the feeling, attitudes of the speaker. Listener can get clear idea of the speakers’ attitudes, whether s/he is interested, being kind, lying, being honest or being bored (p. 86).

Stress is involved is in the whole syllable rather than the individual vowel and consonant sounds. Speaker stresses a syllable “by extra contraction of the muscles of the rib cage, and by extra activity of the larynx muscles” and more probably also by increased in the muscular activity involved in the articulatory movements (Ladefoged & Johnson, 2014,

p. 250)". The performance is on the bases of physiological aspects of speech and these slight changes are occurred unconsciously by a speaker. He continues to say that the distinction in stress is used in English language to make difference as it is used to show the syntactive grouping of words.

International Phonetic Alphabet (IPA)/Phonemic Chart

International Phonetics Association (IPA) consists of vowel and consonant sounds. These vowels and consonants are designed and placed in the chart in a specific sequential series. The chart (Figure 1.3) is displaying 44 sounds of English Phonetics. First portion (left side) indicates 12 vowels (monophthongs) and second part (right side) is related to eight vowels sound (diphthongs) and the last three rows (in the lower portion) exhibit 24 consonants sounds. Underhill, (2005) points out that these forty-four sounds are exhibited on the chart indicating their relationship to each other.

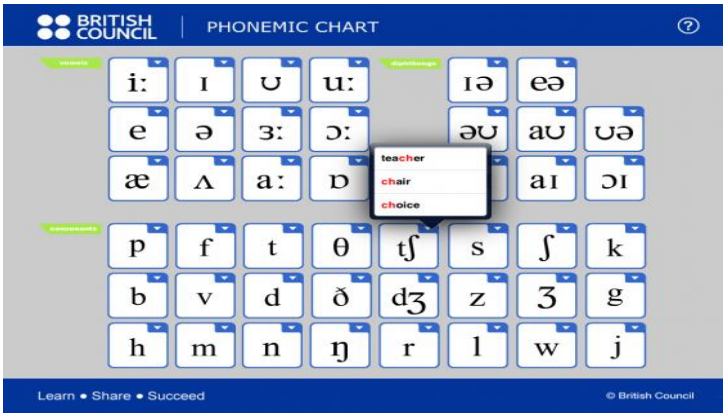


Figure 1.3 IPA Phonemic Chart

www.bing.com/images/search?q=American+Phonetic+Alphabets&view

IPA chart is used with slight modifications approximately in all English language dictionaries. It is utilized for segmental features of pronunciation. However, as far as suprasegmental (stress, intonation, accent and rhythm) features are concerned, it does not provide any description about the prosody features, i.e., intonation or rhythm as well as except mark indicate to stress, there is no any agreed upon criteria about the writing of prosody speech (Skandera & Burleigh, 2005, p .8).

Computer-Assisted Language Learning (CALL)

Davies (2005) defines that CALL is an approach of EL learning and teaching which the computer is used as an assisting agent to the reinforcement, assessment and presentation of the material to be learnt, usually including interactive element. CALL offers a language teacher and learner a number of activities that are carefully planned as a part of the pedagogical room that will help the learner to learn a language. Gündüz (2005) denotes computers are no longer a tool for only information processing and display but also a tool for information processing and communication. Learners of language, with the help of the internet, can now simultaneously communicate with others or speakers of the target language all over the world.

English as Foreign Language (EFL)

According to the linguists EFL refers to an ability to know one or two skills of the language (probably reading and writing) while ESL is interpreted as the capability and having good command of four skills of language i.e. reading, writing, listening and speaking.

English as Second Language (ESL)

It indicates that English is taught as an empowering and dominant language of a particular locality while English as foreign language means teaching of English language where other languages are considered in power and higher status (Johnston, 2003).

1.10 Organization of the Study

The current study comprises five chapters. Chapter 1 presents an introduction and overview of the study. It discusses the background issues of conducting this research and problem statement. Apart from this, research objectives, research questions, hypotheses and conceptual framework of the current study are also discussed in this chapter. Significance of the study, operational definitions of variables and major key terms are also explained at the end of this chapter.

Chapter Two provides a detailed literature review along with elaboration of underpinning theories. Empirical researches regarding pronunciation and CALL are highlighted in this chapter. Different varieties of English pronunciation are explained as well as the required model for intelligibility and comprehensibility to fulfill the local need and international demands for EFL/ESL learners is presented. Furthermore, the use of digital technologies such as computer in learning pronunciation, its implications and complications all are explained with details.

Chapter Three discusses the research methodology regarding development of hypotheses, which were formulated in the current study. Additionally, the rational and justification of the research design, population, sampling as well as the practicality of actual research

plan, instrumentations and measurements for conducting the current experimental research are also presented under this chapter.

1.11 Summary

Chapter one discusses the background of the current study as well as it supplies a solid rationale for conducting the current research. Despite the importance of English language in Pakistan, the learners are not competent user of oral skill. Because of this deficiency they hesitate to speak English or if they try to speak they have to face a lot of communication barriers. Pronunciation being a basic element of speaking module is not emphasized in ESL and it is ignored in language classroom almost at every level in Pakistan. There is a lack of awareness regarding learning and teaching of pronunciation and teachers themselves are not familiar with the basic features of pronunciation. Moreover, prevailed teaching system focuses on receptive skill and rote learning ignoring the productive skills such speaking and pronunciation. No exposure of oral practice is given at secondary school level. Teaching material is no longer helping or assisting any oral capability especially the pronunciation and it neither fulfill the local needs nor the international demands. Grammar translation method is regarded the only best method to teach English as a subject. That is why, Pakistani secondary school learners have pronunciation problems and they are not very good speaker of English language.

This chapter offers an in-depth account of importance and negligence of pronunciation. Government policies, regarding pronunciation learning and teaching and several reasons behind the negligence of pronunciation in Pakistani context all have been discussed with detail.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

The second chapter starts with the theoretical foundation of the study followed by a detailed account of literature review of different articles, journals, theses and books which exhibit a valid rationale for conducting researches on such issues like pronunciation, vowels, consonants sounds as well as use of computer and computer software programs for pronunciation teaching. Furthermore, the negligence of pronunciation learning and teaching throughout the history of language learning process, different language approaches regarding pronunciation and current perspectives in pronunciation pedagogies in the light of underpinning theories, all are discussed here in this chapter.

2.2 Theoretical Foundation of the Current Study

Research is a controlled and systematic investigation to solve the problem, (Gay et al., 1996) to find out new information or to obtain understanding of a phenomenon (Sreejesh, Mohapatra, & Anusree, 2013). On the bases of scientific investigation, assumptions are formulated to accept or reject the hypotheses. Assumptions have pivotal role in research process rather it could be said that all other process of investigating the phenomena revolves around these assumptions. There are different school of thoughts which provide grounding foundation to these assumptions. As Cohen (2007) explained that the

assumptions are germinated from ontological concerns, then towards the epistemological and then move towards the methodological considerations.

As concerned the ontological consideration, it raises the questions whether a found truth or reality existed within individuals or it has outer existence which impressed the humans to figure out their personalities. Whether this reality is the result of individual's consciousness or it is result of interaction with the external surroundings (Côté, 2014; Costanzo & MacKay, 2009; Kahl, 2008). These sorts of philosophical notions paved the way towards the rather more complicated considerations called theoretical implication to solve the social and educational problems.

In this current study an experimental research (underlying positivist approach) was performed quantitatively to analyze the effect of phonetic videos and CALD on English language learners' pronunciation in secondary school in Pakistan. Different underpinning language learning theories are maintained behind the idea to conduct this research.

2.2.1 Cognitive Theory (Jean Piaget)

This theory has two prominent features or models for SLA which are named as "processing model" and "connectionism" (Xiangui, 2005). Processing model gives interpretation that there are nodes in the brain which are considered the property of memory network or neural network (Geeslin & Long, 2014). New information of L2 are encoded in short-term memory it activates controlled process of the nodes. Because of recurring activation of node change the product in automatized and controlled phenomenon. After that, the information are stored in long-term memory. Bablekou

(2009) explained that if the new information remained more than 20 seconds in short-term memory, then there is possibility of either the information are shifted to long-term memory permanently or they are deleted from the short-term memory.

Converting the information into long term memory, firstly it made it preserved for long time and again there is no chance of deleting the information from the long-term memory after being converted into automatic structure. Next, at this stage long term memory can may encounter more complex situation/structure also. Learners of second language learn the language from controlled to automatic situation and from simple to complex phenomenon (Marsden, Mitchell & Myles, 2013).

Second model of cognitive theory is "connectionism" entails that human brain is like a computer in which language acquisition is regarded as development of strength among several connections in brain (Teucher, 2012; Lloyd & Fernyhough, 1999). Supporters of this theory convinced that when second language learner is exposed to linguistic input, it strengthens the mental connections. Apart from this, through repetition it becomes stronger and stronger. As a result, newly acquired linguistic element activates its counterpart and new information becomes the part of the learner's knowledge.

Knowles (2004) mentions that Donald Hebb (a neuropsychologist, 1949) shaped the notion that "neurons that fire together wire together" According to recent research in neural sciences, human brain joins auditory, phonological and visual system in one motion together. The research also argues that without employing media-rich courseware, language learning procedure becomes a horrific event for the second language learners along with some other embarrassing situations (Knowles, 2004).

Furthermore, Knowles (2004) supports this model of "connectionism" and states that in the same way, when different digital devices are used for study purpose, different components of human brain work in the same line to strengthen one another. When learners listen, observe the visual display, process the information then record the information. This action motivates other different blocks (portions) of the brain and becomes the source of long-term learning (Geeslin & Long, 2014).

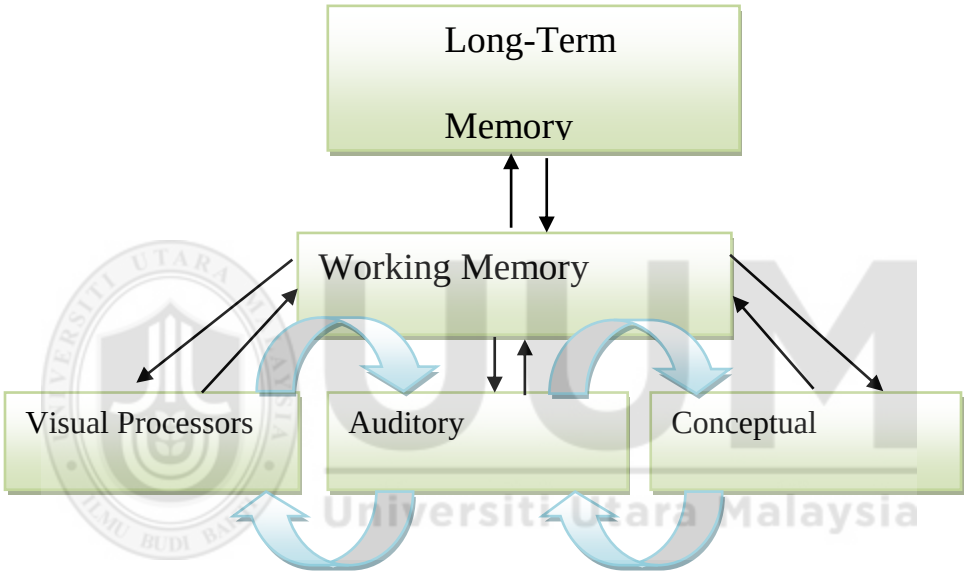


Figure 2.1 Learning Process through Multimedia or Computer Device (Knowles, 2004)

Then, existed stuff in short-term memory becomes the part of long-term memory and get ready to tackle the more intricate structures. So, in this way, language learners go ahead by following the rule of simple to complex and from controlled to automatic process repeatedly (Knowles, 2004). When multimedia related (computer-aided) activities are employed, they give motion to the other one and join the all processors. These workstations encounter and become active participants while involving the process of preserve the information in working memory and long-term memory then join the

different parts together and as well as clarifying language and sensory involvement. In this way "long-term memory, visual information and conceptual processors work together to help decode and fill-in comprehension gaps" (p. 4).

Moreover, cognitive theory encouraged the learners to adopt metacognitive approach in which they started "to think how to learn" and "to learn how to learn". It is the process used in general education which engaged someone's thinking: think about learning activities, think about the task, how the task will be carried out, in what way the task will be completed, what will be the outcomes after accomplishment of the task. Next, the evaluation methods and techniques, availability of the resources: effectiveness, validity, reliability regarding the specific task. Metacognition approach discussed all these above-mentioned strategic schemes with involvement of learner's own thinking (Mather et al., 2009) particularly in language learning perspectives. Additionally, several researches have been conducted these days from descriptive to experimental studies which showed the usefulness of metacognition practices for gifted and slow learners as well (Keeves & Watanabe, 2003).

This theory supports the current study as the participants of Experimental Group 1 did practice on computer and digital dictionary, they were involved in watching, listening and touching the devices with their hands, their learning was transferred from short-term to long-term memory more rapidly with long-lasted effect as compared to Experimental Group 2 as they did practice of IPA sounds orally in less attractive environment of classroom. The learners of Experimental Group 1 used three channels of mind altogether, well performed regarding learning of phonemic sounds and got better results as compared to Experimental Group 2. Cognitive theorists claim that human mind is like a computer

as they promote computer assisted language learning (CALL) along with the expansion of metacognitive approach of second language learning. It also encourages the learners to learn language by imitation, listening and repletion.

However, this theory has to face criticism in terms of considering the individual as single person. According to the critics of this theory, they claim that human learns language by using his own mental capabilities of language learning through his language acquisition device (LAD) i.e. an innate grammar already set in human mind which help (Trask, 2007; Thomas, 2004) to learn language.

Nonetheless, the advocators of cognitive theory ignore this fact that human is dependent upon other society members regarding his language learning. While interacting with other humans, he reacts to his surrounding just for the purpose of storing information in his mind (Ellis, 2015). Again, this theory is criticized just focusing on cognitivists' views about second language learning. The supporters of this theory do not think that language learning as separate entity in the mind. They think that language learning is also one of many information that are under the custody of cognitive mechanism (Myles, 2013).

2.2.2 Socio-Cultural Theory

According to Vygotsky mediation (Lantolf, 1994) either physical or symbolic is the introduction of a helping agent into an action then it connects the human being to the world of mental behavior. Similarly, the physical objects such as hammers, bulldozers, and computers permit the human being to arrange and adjust the physical world. The notion was given by Vygotsky that symbolic tools help humans to get empowerment for

organization and controllability of mental process as a result the humans (learners) are more attentive and able to solve logical problems. They find themselves even more powerful (learning a new language or something new concept). That is why; it is assumed that the graphic tools are more helpful to decrease the gap of ZPD, which assists the learners to achieve the level of expectation.

Vygotsky's Zone of Proximal Development (ZPD)

ZPD is a term which is used for leaner's level of competence between what he can do and what he can do with other's assistance or what he cannot do alone assistance of skilled person or with other helping agents (Bergin & Bergin, 2015). According to Bergin and Bergin, the term ZPD is used as landmark in second language learning. Furthermore, symbolic tools are helpful in getting empowerment for organization and controllability of mental process.

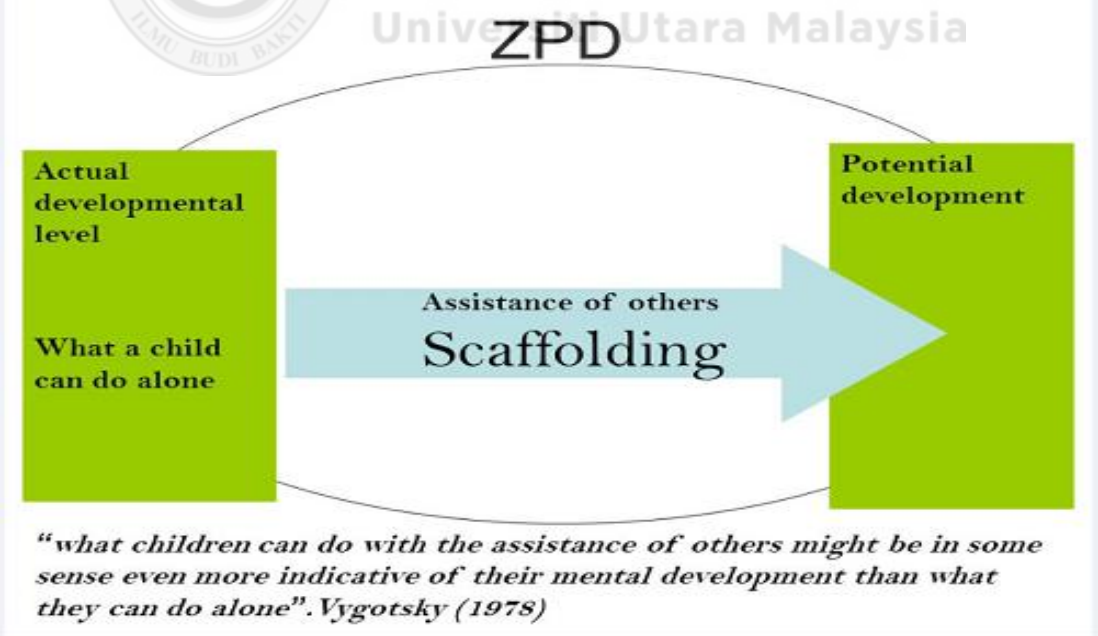


Figure 2.2 Zone of Proximal Development Devised by Vygotsky (1978)

Source:https://images.search.yahoo.com/search/images?p=zpd+and+scaffolding&fr=mcafee&imgur

Vygotsky gave the notion of ZPD through which a learner gets the assisted collaborative learning environment by skilled trainers, teachers, peer or any other device could be applied to accelerate the Zone of Proximal Development (ZPD). According to him, collaborative learning with other people or assisting agent especially in learning environment leads towards development and advancement. Although, this situation is not always responding, however, well and pre-planned learning instructions contributes towards better outcomes. The knowledge of ZPD about the learners, may help the teachers to go into right direction and learning process can be flourished with learner-centered approach. Oxford (1997) explains that in learning process scaffolding is required when learners feel more difficulty level for complicated concepts and the dependency level decreases gradually when leaner feel himself/herself more autonomous and self-directed.

This study is influenced by these above-mentioned theories i.e. cognitive theory and socio-cultural theory. Cognitive theory talks about the cognition and metacognition in human mind. While, socio-cultural theory deals with surrounding and social setting of the learners. In the current research, the learners of Experimental Group 1 showed responsibility for their own learning rather than being treated merely as objects. Whereas, behaviorist theory stresses the practice, repetition, imitation of native models.

Learners were involved in practicing peer learning while working in pair form on computer in language lab with the help of language learning material as CALL program, i.e., devised by the current study provided the external environmental support as mediator

and agent. By employing computer as mediating device and instructor's guidance finally they performed better as compared to the group who were not shown phonetic videos and digital dictionary. The participants of Experimental Group 1 got the potential level which was expected before scaffolding of computer. This technique was also very helpful regarding internalization of the IPA sounds. Levis (2007) opines that although, there are very few researches; however, computer can provide a lot regarding learning and teaching of pronunciation.

By using the channels of digital devices for Experimental Group 1, this study entails the metacognition, in which, the role of the teacher is as facilitator/guide and he encourages the learner to be initiative while achieving their goals, setting objectives and the most important element of learner autonomy which is self-assessment (Pawlak, 2013; Ritchie & Bhatia, 2009).

2.2.3 Behaviorism Theory

The current study was also under influence the Skinner's theory of Behaviorism (1950-60) learning on stimulus response bases (Fasold & Connor-Linton, 2013). According to this theory the task of second language learning is just like learning of L1 or mother tongue and second is learnt like L1 by reinforcement, imitation and repetition language (Fasold & Connor-Linton, 2013). Behaviorism promoted Audio-Lingual Method (ALM). In ALM learners are encouraged to listen the pronunciation, and then imitate that listening, recording their own speeches, dialogues and drills are the practices that develop habits (Flowerdew & Miller, 2005).

The behaviorism theory, stresses on reinforcement, repletion and imitation without knowing the meaning of the words. Drilling and practice have vital role in language learning. There are many computer software programs which are developed on the bases of drilling and practice. They provide the learners active efficient and more powerful stimuli for language learning. Imitation and drilling are very advantageous activities if utilized with understanding rather than parrot like memorization. Woollard (2010) interprets that modeling, shaping and chaining of the responses enable the learners to gain knowledge of complex and refined responses to a wide range of events. Progress in learning happens when reasonable behavior encounter with positive reinforcement.

Another approach promoted by Behaviorism theory is Audiolingualism and Oral Approach (1940s-50s). According to many historians of language teaching, it was considered that during 1940s-1950s second World War and the military requirement for oral skill and proficiency had a significant role in the establishment of Audiolingualism in United States and of the Situational Language Teaching in Britain (Richards & Rogers, 2001). Through approaches, pronunciation got significant place and it was taught from initial stages of foreign language learning. The teachers utilized the information from phonetics, like visual transcription system (modified IPA or some other systems) with articulation of the different sounds. Apart from this, teachers used to employ different contrastive structural techniques such as the minimal pair drill (Celce-Murcia et al., 2006). This method encouraged the learners to listen the pronunciation, reproduced that listening, recording their own dialogues and speeches as well as drilling are performed to develop habits of the learners (Flowerdew & Miller, 2005).

In the current study, on the bases of the main features of behaviorism such as practice, repeated drilling on same learning material and recording the utterances support the current study. As participants of Experimental Group 1 performed the repeated practice during the entire treatment plan. They repeated the IPA sounds again and again by listening the phonetic videos and tried to imitate the sounds through CALD dictionary as well as they recorded their voices in dictionary when they learnt new sounds, they were motivated a lot and they performed the task happily with getting bored.

2.3 Empirical Studies on Pronunciation through CALL

Jenkins, (2004) interprets that use of computer in pronunciation teaching of earlier times, dealt with the segmental approaches and has focused on individual phonemes. She gives some examples i.e. the SPECO Project, (speech training system) a newly developed system, by employing advanced speech technology in the clinical remediation of children's speech pathology, and a continuous effort is being done to make this system to be used for teaching of second language pronunciation appropriately and wisely.

Another experimental study was performed by Saito (2007) in Japanese context. The researcher chose 6 adult Japanese learners, among them 4 learners were selected for the experimental group and 2 for control group from the University of Syracuse. The researcher gave treatment to the experimental group while the control group was not given any instruction during the treatment plan. It was a pilot study targeting only one sound that is low front vowel /æ/) and this sound does not exist in Japanese language.

This study has clear and achievable objectives with sound methodology and it was a good attempt in research field. The researcher used Praat for instruction and analysis. The current study is different in two ways, as Saito conducted a pilot study with only one vowel /æ/target sound whereas, the current research is a complete project of teaching of 44 IPA phonemic sounds via computer to secondary school learners. The second thing, the researcher of the above-mentioned research did not supply any treatment to control group, while in the current research both the groups were given treatment, though the nature of treatment was different, i.e., control group got traditional method whereas the experimental group was given innovative treatment. Because, in researcher's opinion, if the control group was not given instruction, definitely there will be a difference after the treatment. Thus, one cannot infer that the improvement is because of innovative treatment.

Lambacher (1999) employed an Electronic Visual Feedback (EVF) to get acoustic data to assist the Japanese ELLs to improve their perception and articulation of the consonant sound. He postulates that it is very complicated task for non-native learners to identify the non-native sounds; however, by using EVF, it becomes easier. In his research, Lambacher supplied a speech contrast and cross-linguistic comparison of Japanese and English consonant sounds to apprehend better the difficulties faced by Japanese learners. The purpose was to get acoustic analysis of the learners' speech and immediate feedback. Mainly there were two main features of EVF as it was very easy to use and its network characteristic. Apart from this, pronunciation software has dual display which made easy for learners to match the native pronunciation with their own utterances as well as learners can visualize their articulatory movements through the screen and make

correction of their mistakes. The researcher chose some sounds of consonant i.e. nasal stops (pʰ tʰ kʰ, m n ŋ), the liquid contrast [ɹ-l/, the fricative contrasts /s/ –/ɸ)/, /ʃ/–/s/, and /f/–/h/) consonant sounds. Learners can visualize their own pronunciatio0n mistakes at the same time comparing to standard models (native speaker or teacher), then they could modify or make correction of the pronunciation. The current study is different from Lambacher' s study in different terms. Firstly, in this research, researcher chose few particular consonant sounds and it is a contrastive study, as contrastive analysis of Japanese and English consonant sounds was done. Secondly, the researcher did not give subsequent analysis of usefulness of the program. Whereas, in the current research, all vowel and consonant sounds a complete IPA chart was used to evaluate the effect of CALL on secondary school English language learners in Pakistani context with complete analysis of the pretest and posttest of the experimental group 1 and 2.

Olson (2014) performed his research in L2 Spanish classroom to observe the usefulness of visual feedback paradigm at segmental level. The study was conducted on twenty –five intermediate level learners (native English speakers) who were learning Spanish in second semester at a public University. All the respondents participated voluntarily and they were not given any reward for taking part in this research. All responses of the participants were assessed on a Likert scale 1-9, with 1-signifiying, 'strongly agree', 5 signifying 'Neutral' and 9 'strongly disagree'. Respondents informed that they downloaded the Praat program easily as well as relevant recordings and generating their own production. The researcher concluded that pronunciation software such as Praat, could be used potentially for the learners in lower levels of classrooms instructions. The main purpose of the author was to evaluate the claims by previous researches (Derwing,

2010; Setter & Jenkins, 2005) about the usefulness of speech analysis software, their usefulness as well as examining the sophisticated and intricate nature of these software in L2 context. The study matches with the current research, as the both are related to the effectiveness and usefulness of the computer-assisted pronunciation learning and teaching.

Kim (2012) conducted a case study to find out the usefulness of computer-aided instructions to teach mainly suprasegmental features i.e. stress; however, segmental were also in focus. Two male Korean learners with majoring in science were selected at graduation level. The duration of the study was two months and researcher taught stress, rhythm and intonation as well as vowels and consonants. The researcher used "Technology Enhanced Accent Modification" (TEAM). Participants showed interest and there was positive change regarding enhancing of suprasegmental feature as compared to segmental features and they observed a lot of improvement in fluency and quality in their non-native version of pronunciation. The difference between the Kim's study and the current study, Kim emphasized suprasegmental features the most as compared to segmental one, while in the current study only phonemic sounds (vowels & consonants) were under investigation. However, both the studies are similar in terms of selecting human raters for speech analysis of the participants. In current study, the researcher also hired human raters to see the current level of their pronunciation sounds in pronunciation test on 1-9-pointLikert scale before the treatment and after the treatment to observe the improvement in their pronunciation test through CALL program.

Gambari, Kutigi and Fagbemi (2014) took sample of 60 learners (15 males and 15 females) from two coeducational secondary schools in the premises of Minna Metropolis.

The researcher in this study taught segmental (vowel & consonant) and suprasegmental both the features of pronunciation. Control group was given treatment of the same material traditionally. The duration of treatment was four weeks. The Oral English Achievement Test (OAT), comprising 50-items of multiple-choice items were employed. The data was analyzed using a t-test, One-way ANOVA and Scheffe's post-hoc test.

The results of this study concluded that the learners who were given computer-assisted instructions to enhance pronunciation, performed better rather than the learners who were taught by traditional classroom. The design was chosen pretest, posttest and delayed posttest. The major difference between this research and the current research, is that in this research, researcher selected both the participants males and females, whereas, in current research only females were selected. Another point of difference is that in this research the focus of the study were both the features of segmentals and surpasegmentals. Nevertheless, overall, findings are same. In both the researches, significant improvement was regarding improving pronunciation.

Bott (2005) suggested that that computer-mediated instruction raised the awareness proved very helpful in regard to learning suprasegmental features of pronunciation. She used "Pronunciation Progress: Stress in American English" pronunciation software for to teach stress (syllable stress, word stress, sentence stress) to the learners. The main element of this research is that the pronunciation software; "Pronunciation Progress: Stress in American English" which was used in this research was designed by the researcher herself. After spending a considerable amount of time on this project she was able to launch this software. Originally, it was prepared for intermediate to advanced learners of English. This project provides self-accessed, interactive practice, explanation

and feedback regarding suprasegmental feature of stress. Before starting work on her project, the researcher got basic training for computer programming, then she reviewed current ESL pronunciation teaching texts and pronunciation methodology text prepared for ESL teachers.

Overall, it was very good research, researcher explained every step of her instructional material with minute detail. The difference between this research and the current research could be viewed in a way, as it was a pilot study; there was no pretest and posttest as compared to the current research. Secondly, the main focus of the Bott's research was suprasegmental features, i.e., stress only. However, it was a good effort regarding bridging the gap between theory and practice. Participants liked the software and the researcher got positive effect of computer-augmented pronunciation teaching. They told the researcher that they enjoyed the whole program. Bott's studies showed that the actual purpose of the research was to know the reaction of the participants about computer assisted pronunciation (CAP) rather than improving pronunciation through computer.

Hincks (2003) performed his study on immigrant professionals in Sweden. Eleven respondents attended this course and they were given a copy of "Talk to Me". This software was designed to do practice general communication skills particularly pronunciation training is programmed at phoneme level, word level and sentence level. At phoneme level, mouth movement of the articulation with visual feedback was shown to the learners. They could compare their own utterances to native model especially the waveform and pitch contour. The user could also control the speed of the spoken speech to make those utterances more understandable. The software was generated for oral skill employing animation as an intelligent language tutor. The study tried to examine whether

speech recognition software would improve the general standard of pronunciation of a selected group of middle-aged immigrant professionals studying English in Sweden. The Eleven students were provided a copy of program “Talk To Me” and were asked to do practice at home having unlimited access on computer software. The selected learners were pretested and posttested on Phone Pass SET-10 test from Ordinate Corp. After, 200 hours practice, the performance of the participants was compared with 15 learners of control group. Findings of the results showed that after doing practice through “Talk To Me” learners improved their communication skill remarkably especially the pronunciation skill of oral communication.

Although, this study is good in its own way. However, some ambiguities are involved in this research. Researcher did not explain how he selected both the groups i.e. the experiment and control group and on which criteria they were assigned as experimental and control. Next, control group was not given any sort of treatment. That is why, it could not have claimed that the improvement in pronunciation was the very effect of this computer software.

AbuSeileek (2007) conducted the research to evaluate the effectiveness of computer assisted pronunciation teaching especially on stress at word and sentence level. The participants were 50 EFL learners of the Department of English Language and Literature, College of Arts, King Saud University. All were male learners enrolled in a BA program aiming at encouraging the learners towards common Humanitarian values and attitudes. Integration of computer technology was a new policy of English Department. A CALL center was launched and setup for many language labs was established in the department with software packages and hardware devices. The researcher used Mounton Interactive

Introduction to Phonetics and Phonology for the current research with focusing on stress pattern at word and sentence level. In Phonetic module, the program comprised of all aspects of acoustic, auditory and articulatory phonetics, while in phonemes section, some prominent features of pronunciation were included such as non-linear phonology, optimal theory and both the sound systems, i.e., British and American English.

Apart from this, that program had some other distinguished feature such as bibliographical references, help facilities, a glossary of important linguistic terms, a text-editor to assist the learners regarding usage of CD-ROM, and the above all, there was an interactive tutor consisting different activities and exercises. Control group was given the print material of that program. The design of the research was pretest/post-test control group. A regular class was taken for this experimental research and then divided randomly into two groups i.e. group 1 and group 2. The duration of the study was two sessions for 12 weeks' time (30 minutes in each session). Questionnaire and Interview were employed as data collection tools to know the general attitudes of the learner s regarding CAP instruction. A 1-5-point Likert scale was used to evaluate the effectiveness of the program and two human raters were appointed to assess the 1-5-point Likert scale. Pilot study was also performed. Chronbach's alpha reliability was measured with .88. SPSS was used as data analysis tool and t-test was administered for mean and standard deviation of the treatment plan. The researcher implemented 6 activities such as 'identification of stressed syllables in real words, stressed syllables in nonsense words, stresses syllables in synthetic words, phonemic transcription, weak form identification, stress identification in real-life dialogue. The findings of the activities that were based on unreal words, phrases or sentences revealed no significant difference between both the

groups. The findings of the four activities revealed that no significant difference was observed in mean. On the other hand, findings of the last two weeks showed significant difference in both the groups. These activities were based on real words, phrases or sentences there was higher mean score than the activities related to unreal or synthetic words. The learners gave positive responses for computerized instructions.

Although, the above-mentioned study is well-performed and the researcher mentioned all the methodological procedure in detail. Nevertheless, this study differentiates the current research in terms of data analysis tool as in this research the researcher (AbuSeileek) used questionnaire and interviews whereas the current research, quantitative tools were employed for data collection and analysis. Again, this study also focused on stress pattern which is suprasegmental feature of pronunciation while the current study used segmental feature IPA sounds only.

Woottipong (2015) also gave computer-based pronunciation instructions to the learners of Thai University. The duration of the study was 34 teaching sessions. The sample of the study was 72 (out of 192) first-year students in General English II in second semester of the academic year 2013 was selected randomly at Turkish University Thailand. Duration of the study 34 teaching periods. Experimental and control two groups were formed. Overall, this research meets the basic research criteria for experimental research design. The researcher explained all the procedure randomization, sampling, forming of two groups, data collecting and analysis techniques with greater detail along with the in-depth discussion on the computer assisted pronunciation package. Mean difference and t-test

data analysis techniques were used in that research. Findings of the research revealed that a significant improvement observed using computer to English pronunciation

The researcher states that 'listen and imitate', phonetic training, minimal pair drills and visual aids. However, this package does not provide the detail such as which pronunciation feature was meant to be improved segmental or suprasegmental one. By practice of listen and imitate, minimal pair drills one can understand that phonemic sounds were under investigation, however, the researcher did not supply the detailed discussion of computer assisted pronunciation instructions and this flaw could be observed by the reader easily.

Tuan (2010) conducted his study on fifty-four first-year student of class 2010 A, having major in tourism and twenty teachers from English Department at Hung Vuong University. He used three pronunciation software i.e., Pronunciation power 1, Pronunciation power 2 and third one "Lose Your Accent in 28 Days" (LYA28). Pronunciation Power 1 and Pronunciation Power 2 had different distinctive features such as lessons and exercises along with audiovisual detail of all phonemic sounds through which the learners could select and learn some specific sounds. Apart from this, the description of inner part of the mouth and vocal tract from side view and front view were shown through Pronunciation Power 2. Whereas, "Lose Your Accent in 28 Days" demonstrated video clips of sample words with related minimal pairs. Through, these software, it was easy for the learners to choose a particular sound for practice. Metacognition approach of software aggravated the learners and raised awareness through pronunciation software regarding discrete sounds and motivation level was increased by the learners as they did more and more practice by themselves either with

the assistance of the teacher or without any teacher's cooperation. Overall, this study is good and fulfills all the prerequisites of basic research. As far data analysis tool is concerned, Praat (Version 4.6.06) was utilized, in researcher's view machine cannot be replaced by humans. There are some limitations while using machines, since the participants were Vietnamese, and the input feed in Spectrograms usually comprised of native accents/sounds most probably from General American (GA) or Received Pronunciation (RP) that is why, particular feed program cannot be used for every situation, it might be useful for a particular setting. As Derwing, Munro, and Carbonaro (2000) interpret that this could not be claimed that (pronunciation) software exhibit the 70% accuracy level for nonnative speakers as these software are not fit to understand the human sounds correctly.

Taun's study is differs from the current research, in which researcher used human raters with 1-9-point Likert scale to analyze the research data instead of Praat as data analysis tool. There is ambiguity regarding pronunciation test made for the pretest and posttest. The researcher did not discuss clearly, whether the test was conducted orally or it was based on written responses by the participants.

However, Harper (2004)'s researched on CALL based pronunciation and to evaluate its effectiveness for beginner level ESL learners at Multimedia University (MMU) in Cyberjaya Malaysia. The researcher selected two groups of the learners (9 in each group) and they were asked to write down 4 of 5 words in which they have pronunciation problems signifies that in his study there were signs of improvement among the learners in their pronunciation skill but the progress was not according to his expectation because of the shortage of the time. Learners found it easier when they did practice the word in

segmented order. Learners worked in pair form, using one computer for two learners and this thing also helped in the improvement of their pronunciation skills. The learners practised the sound spellings in the CALL format and then with each other. He states that the sound spelling had a positive effect on the learners. They seemed to enjoy the procedure and there was improvement despite of the fact that they had very short time. This is small scale study and there is lack of comprehension and grammatical structure and it does not give overview of the study. No research purpose was discussed by the researcher. The research was lacking some basic research elements.

Lee (2008) has used two computer software programs "MyET" and "Issues in English" at Chinmin Institute of Technology in Mio Li County, Taiwan to improve the pronunciation of 153 Taiwanese College and University learners in different fields of study, ages from 18-23. In Lee's statement, there are advantageous effects of using pronunciation software to improve the pronunciation of ELL. An action research was conducted. This study has similar findings with the current research, as the participants were excited while engaging in this novel type of program which was different from traditional classrooms and that characteristics of correction prompt feedback, functions of recording, scoring and the most important feature, software had to give instructions how to improve their pronunciation errors. Lee found that teaching of pronunciation through CALL was helpful in teaching of English language pronunciation. The transformation of the traditional classroom towards the multimedia speech laboratory made the learners to get more awareness about the software. In this way, they experienced a new technology for learning pronunciation as well as their interest and curiosity aroused to get more and more learning to enhance their pronunciation skill.

This study differentiates the current research, as it was an action research while the current research was an experimental research with the pretest, posttest two treatment design. In this researcher two computer software program were utilized to teach pronunciation to college and university learners. However, the selection of the underpinning theories coordinates both the researches. Cognitive theory (Jean Piaget) and Vygotsky's concept of *scaffolding* were employed in both the studies while utilizing the role of computer as mediator i.e. helping agent in second language learning. Behaviorist approach was also under consideration in both the researches for drilling and practice of dependent variables

However, Hua (2006) performed study on computer assisted pronunciation teaching. For this purpose, researcher selected 9 learners (four girls & five boys) with their Chinese L1, studying in a university of technology in Taiwan. Researcher taught all nine learners for three years before initiation of this research program. All the participants were divided into three groups on the bases of proficiency level of their English-Speaking scores. The purpose was to get the learners' perception regarding usefulness of the MyET pronunciation software. Both the segmental and suprasegmental analysis of pronunciation were performed. However, data analysis tools were semi-structured interview and survey questionnaire. After introductory session, the experiment was conducted with the participants one by one. Hua drew conclusion that computer software program for pronunciation such as MyET was not helpful in improving learners' pronunciation and was not proved as an effective tool. It was a small scale study with 2 hours treatment in language. Pilot testing was not performed prior to start the actual study. Results also indicated that the learners felt much difficulty regarding speech samples provided by

native speaker in MyET software. They wanted to try easy and slow specimens for their practice. Furthermore, learners also did not like the idea of animation digital scoring and they expressed that extra practice on the software did not give much help regarding their pronunciation problems. On the whole, the study was a good attempt in regard to speech analysis of suprasegmental features of pronunciation.

Kumar and Madhavi (2012) have done their study to assess the advantages of using Computer Assisted Language Learning (CALL) lab with different language learning software such as Pronunciation Power 2 and Cambridge Advanced Learners' Dictionary were employed in this study. A complete list of IPA symbols with one example each in English were included as lessons for the learners. The purpose was to obtain perception of the sample teachers in Andhra Pradesh regarding use of pronunciation software and to examine, whether their learners improved the suprasegmental features such as stress, intonation and rhythm at intermediate level after that they were trained in CALL lab. The result that was obtained from the most of engineering learners showed accurate pronunciation practice. The duration was 50-70 instruction hours that the learners had to identify vowel and consonant sounds, nevertheless, some more time was required to get better outcomes. The teacher also needed formal training before teaching pronunciation classes. This study is similar to the current research in terms of using material CALD as pronunciation software. Same dictionary was used in both the studies. The difference can be observed with the current research, in this study, learners did practice on sentence level to enhance the ability of speaking and to identify the specific words. However, in the current research learners did practice on word level as the purpose was to improve the sounds not accuracy and fluency.

Hismanoglu and Hismanoglu, (2011) conducted their research on Turkish EFL learners. The Learners were taught, vowel chart, monophthongs, diphthongs and tripthongs and classification of vowel according to height, position of the tongue, tongue frontness, tenses/laxness of vocal cords. The duration of the study was two weeks. The purpose of the study was to emphasize the importance internet-based pronunciation lesson. The researchers performed the pretest and posttest and got the positive findings of teaching pronunciation through internet. Muller (2005) employed videos to teach learners some particular vocabulary through story telling. The findings revealed that usage of videos accelerated the learners regarding enhancement of the vocabulary skill. After listening the story on videos, learners were asked to repeat the story in their own words.

Another study conducted by Uzum (2009) suggested that the use of videos in classroom, the learners of the experimental group were more enthusiastic than the learners of the traditional group were. They wanted to perform the role eagerly which they had watched through videos and improved their English language skill as compared the traditional group.

Nadeem, Mohsin, Mohsin and Hussain (2012) performed a CALL based research in Pakistani context. They selected 50 perspective teachers, for their 16 weeks' training to enhance pronunciation skill through CALL at secondary school level. The pretest was performed to examine the teachers' current level regarding pronunciation skill. The study was participatory cum empirical endeavor to analyze the effect of CALL on pronunciation skill. Results of the posttest indicated that the teacher not only improved their vowel and consonant sounds, there was also improvement in their intonation and stress pattern. As this study was conducted in Pakistani context. In this research, the researcher did not identify

whether the same test was used as a pretest and posttests or different tests were conducted. Secondly, the pronunciation test used as a pretest, the researchers used symbols of vowels and consonant. Whereas, Pakistani learners are not familiar with phonemic symbols and sounds, therefore, it would be better if words were written against each sound, then learners read the words easily and their sounds level could be judged by pronouncing the particular words. Secondly, for data analysis simple percentages were employed, not any systematic data analysis tool was used. Thirdly, there was only one research question which was not clear as the research question was *"*Do the perspective teachers, who are taught English pronunciation through CALL by the perspective teachers can better their articulation so far as individual sounds, word stress and basic intonation are concerned?" as one can perceive the sentence 'perspective teachers who are taught English pronunciation through CALL by the perspective teachers' this needs to identify the research question. So, it could be said, more elaboration is required to maintain the research standards.

Although, an enrich literature is already existed regarding CALL and pronunciation, still this research has its own distinguished features which separate the current research from other previous researches. However, literature also suggested that the most of the studies are performed on suprasegmental features of pronunciation while the current research is completely about segmental features. If some studies are conducted on segmental features, the number of the participants is very small for limited span of time. Such as a research was conducted for 2 hours only using MyET software to improve pronunciation. There are some other issues regarding research design, methodologies, procedure and data collection and analysis tools. Some experimental studies are done on single experimental group, if there are two groups, control group was not given treatment. If there is no treatment to the control group and only the experimental group is supplied

innovative treatment, one cannot generalize the results whether improved results are because of treatment or anything else is involved. Some other research flaws could also be observed through the reviewed literature such as in some studies, pilot testing was not performed or clarity of the procedural plan was missing.

In the current research, researcher has tried her best to avoid all above-mentioned shortcomings from selection of the relevant school, sampling of the participants, authentic formation of two groups, i.e., experimental and control, (according to the research paradigm), and other prerequisites such as piloting the data, reliability, validity, pretesting, posttesting, treatment plan until data collection and data analysis tools all are explained in greater details. After a detailed discussion of literature review, some literature gap can be identified in the above-mentioned researches.

As discussed earlier that Pakistani learners do not have familiarity regarding 44 IPA sounds. Although, some studies have been performed in local context but there is a dearth of such studies to identify the importance of IPA sounds, their identification, perception and articulation of phonemic sounds. Therefore, it is expected that this study will fill the gap to a greater extent to work on pronunciation through digital devices in Pakistani context.

2.4 New Trends in Pronunciation Pedagogies and 21st Century

Concerning pronunciation teaching and pedagogy, many questions were raised at the scene of ESL curriculum. For example, Morley interprets:

> There were questions about the importance of pronunciation as an instructional focus, questions about whether or not it could be taught directly at all, questions about the assumption it could be learned at all under direct instruction. The effect was that more and more programs gave less and less time and explicit attention to pronunciation; many programs dropped it entirely (Morley 1991, p.485).

Moreover, Jenkins (1998) suggested that among other developmental changes in regard to pronunciation, the English language was utilized as overwhelming instructional medium of communication. Next, there was a shift from believing in native-like accent to targeting intelligibility became more realistic and convenient purpose for ELL (Hinkel, 2006).

Learner needs, wants and individual differences became the major components as well as learners' active role was emphasized in language learning (Morley, 1991). Now the pronunciation is being taught by employing different techniques such as the use of fluency-building activities, accuracy-oriented exercises which draw attention to multisensory methods of pronunciation learning, the utilization of authentic materials and the adaptation of instructional technology in pronunciation teaching. Some other fields also supplied new ideas to as speech pathology, drama and psychology (Celce-Murica et al., 2006, p. 5).

Evans (2009) opines that in the current scenario, the situation of neglecting speaking in ICT-based lessons, is changing. As we can see, in England, now emphasis is shifted to use of technology as a major tool for learners' oral skill and audio-visual production of the desired language. Further he discussed that 25% action research projects aided by Centre for Information on Language Teaching (CILT) consist of innovative ICT-related task by modern languages teachers. The most attention-grabbing point is that in those

researches the main emphasis was on the development of dynamic use of desired language. Approximately, ten of the projects were with the purpose to generate speaking skill (including pronunciation), whereas, eight projects were related to writing skills (including narrative and creative skills), while, eight comprised of presentation tasks including internet research and multimedia outputs.

However, this similar situation can also be observed in USA. Rhodes and Branaman as cited in Evans (2009) where recently, the focus of the policy makers at national level is to increase the supply of hardware in schools, establishment of virtual schools to fulfill the increasing emergence of student in distance-education. Apart from this, US Department of Education-funded named as "Foreign Language Instruction in the United States: A National Survey of Elementary and Secondary Schools" conducted by the Center for Applied Linguistics during 1997 and 1998. The report demonstrated a significant increase usage in technology that is about 20% to 52% in secondary schools.

Furthermore, the Australian government in 2008 launched the Digital Education Revolution policy spending $1.2 billion over five four years to grant computer technologies for secondary school learners in the school for 9-12 graders. The purpose of this Digital Education Revolution was to contribute sustainable and meaningful change to teaching and learning in Australian schools that would prepare learners for further education, training, jobs for future and to live and work in a digital world (Evans, 2009).

Furthermore, Fraser (2001) adds that to get better results, learners should be indulged in practical approach rather than memorizing the fact. She explains that although, the learners feel relaxed in learning rules of pronunciation because it is not alarming and

threatening as actual speaking. Nevertheless, it is also recommended by her that the learners must do practice again and again and it is advisable to repeat the specific phrase or sentence twenty or fifty times, those phrases and sentences which could help the learners outside the classroom for purposeful learning. She further sheds light that ESL/EFL teachers should be supplied such courses and materials that could help to improve the usefulness in teaching pronunciation. The purpose of (current) researches should not be on importance of pronunciation but focus of the researches must be mainly on high quality authentic material especially compute based materials with audio demonstrations which could be utilized by teachers and learners as well as pronunciation methodology (Fraser, 2001).

2.5 Intelligibility and Comprehensibility

English language is taught and learnt in every educational institution of Pakistan. However, communicative competence and command have always been major problems for Pakistani learners. Shahzada (2012) explains that Pakistani English users have to face problems related to their intelligibility and comprehensibility. The ability of understanding of both the speaker and listener is called *Intelligibility* and it does not merely depend upon listener. Levis (2007) signifies that pronunciation-related barriers are comprehensibility, accent and mutual intelligibility. Intelligible pronunciation is the main purpose of teaching pronunciation in any course rather than perfect competence (Morley, 1991).

Additionally, Derwing, Munro and Wiebe (1998) have the opinion that main emphasis must be put on intelligibility and comprehensibility instead of accentedness. Mutual intelligibility is a crucial concern in areas where English is learnt as a second language (Derwing & Munro, 2005). Intelligibility is a basic requisite in human interaction and it is being used by telephone companies, sound engineers, architects, speech language professionals, air traffic controllers and many others for several decades (Levis & LeVelle, 2010).

Some critics such as Levis (2006) and Koike (2014) point out that it is the ability of speaker, on the other hand according to some -linguists, this ability is concerned to the listener. Intelligibility is an ability of speaker and it is referred to the quality of utterance to be understood. It is the listener's ability of recognizing the words, in contrast, the comprehensibility indicates to know the meaning of words (Derwing, 2010; Levis ,2006; Koike, 2014). Gilakjani interprets that "increased self-confidence, and the speech monitoring abilities and speech modification strategies" is called as intelligibility (Gilakjani, 2012, p. 119).

Whereas, comprehensibility is an assessment of how tough and stress-free an individual's pronunciation is to comprehend. It is the capability of the listener for better understanding (Kenworthy, 1988; Nelson, 1993; Saito, 2011). Comprehensibility can be achieved through wide range of native exposure and contextual understanding. Learner's grammatical competence enables the learner to know the meaning according to the context and a sentence has more than one interpretation and learner has also to find out logical relationship between the words and sentence (Radford, Atkinson, Britain & Spencer, 2009). Such as in this example "He has lost the match". Apparently, this

sentence has two meanings (i) match means a sporting encounter (ii) match means a small piece of wood tipped with easily ignitable material.

Likewise, some words have different meanings in different situations according to the context, for example the word “table” either means ‘a piece of furniture with a flat top and one or more legs’, or table means ‘a set of facts or figures systematically displayed, especially in columns’. Another word “head”, if it is a noun the meaning will be the upper part of the human body, or the frontal or upper part of the body of an animal, typically separated from the rest of the body by a neck, and containing the brain, mouth, and sense organs, if it is an adjective then meaning will be chief or principal, or if it is a verb then meaning (i) will be the leading position on, (ii) give a title or caption to http://www.google.com.pk.

So, comprehensibility is the learner’s ability to understand the meaning clearly according to the context. If the learner would have wide native exposure and grammatical competence, it would be easier to inference the exact meaning clearly without any ambiguity. It could be said “accent is difference, comprehensibility is effort and intelligibility is actual understanding” (Sewell, 2016; Radford et al., 2009, p. 29). The goal of teaching pronunciation must be intelligibility and comprehensibility instead of accentedness. Comprehensibility is announced as “knowing the meaning of the expression” (McKay & McKay, 2002, p. 52) and interpreted as an experience of listener (Munro, 2008) in judgment of complexity in understanding utterance.

Moreover, there are some models designed by different linguists to achieve the acceptable intelligibility. Nevertheless, explains that in third world countries use of

English as an instrumental or utilitarian purpose, and no need is felt for native models (Rahman (2014). However, the variety used by speakers of third world countries is not comprehensible and intelligible and does not fulfill the demand of international needs. Celce-Murcia et al. (2006) suggested that the level of learners' pronunciation must meet such criterion that s/he has potential to communicate with other people without any hesitation. It is more important that speakers of English can achieve:

Intelligibility (the speaker produces sound patterns that are recognizable as English) Comprehensibility (the listener is able to understand the meaning of what is said) Interpretability (the listener is able to understand the purpose of what is said) (Burns & Clarie, 2003, p. 5). Skandera and Burleigh (2005) proposed that there are two broad categories of phonetic features. The first one is the category that has no relationship neither with the sound system of RP nor with the English accent. These are relevant only phonetic bases and are not related to segmental phonology of English. The second distinctive category comprised of those features which are relevant not only phonetically but phonologically also.

Furthermore, Celce-Murcia et.al (2006) suggested that learners must learn the foreign or second language at the level of acculturatation. The term of 'acculturatation' has been defined by Schumann (1990) by stating that acquisition of new language is a part of acculturation and it is the evaluation of the degree to which learners are acculturated to the host community. It is also a psychological and social encounter between participants of specific group and individuals of target culture. It means that the amount of time spent in target culture has significant impact on learning English language especially pronunciation of non-native learners.

However, Morley as cited in Celce-Murica et al. (2006) indicate that nowadays at least there are four groups of English language learners for whom a high level of intelligibility is required and they need a special help to improve their pronunciation.

1. Foreign teaching assistants and sometimes foreign faculty in colleges and universities in English-Speaking countries

2. Foreign-born technical business, and professional employees in business and industries in English-Speaking countries

3. International business people and diplomats who need to use English as their working lingua franca

4. Refugees (adult and adolescent) in resettlement and vocational training programs wishing to relocate in English-Speaking countries

(Morley as cited in Celce-Murica et al., 2006, p. 7-8).

However, Celce-Murica et al. (2006) add two more groups of people and state that

5. Teachers of English as a foreign language who are not native speakers of English and who expect to serve as the major model and source of input in English for their student

6. People in non-native English-Speaking countries working as tour guides, waiters, hotel personnel, customs agents and the like, who use English for dealing with visitors who do not speak their language (Morley as cited in Celce-Murica et al., 2006, p. 7-8).

They further explored that the actual purpose of teaching pronunciation is to assist the learners to get minimally required competency in pronunciation and it is more reasonable and rational approach rather than force the learners to acquire native like pronunciation. Additionally, native like pronunciation cannot be achieved for adult non-native speakers until the person reborn) (Felix as cited in Cook (1999). Different researchers support the idea of intelligible pronunciation instead of native-like pronunciation (Saito, 2012).

Native like pronunciation cannot be achieved because of mother tongue, context and age effects (Chen, 2016; Hayati, 2010). So, it seems unrealistic and unnatural (to hide the identity of non-native learners) to seek native like pronunciation of English language. However, second language learners must fulfill at least minimal level of pronunciation, so that they can communicate without any hesitation. So, it could be said that intelligible pronunciation is one of the basic element of oral communication.

Furthermore, according to Fraser (2001) learners should be indulged in practical approach rather than memorizing the fact. She explains that although, the learners feel relaxed in learning rules of pronunciation because it is not alarming and threatening as actual speaking. Nevertheless, it is also recommended by her that the learners must do practice again and again and it is advisable to repeat the specific phrase or sentence twenty or fifty times, those phrases and sentences which could help the learners outside the classroom for purposeful learning. She further sheds light that ESL/EFL teachers should be supplied such courses and materials that could help to improve the usefulness in teaching pronunciation. The purpose of (current) researches should not be on importance of pronunciation but focus of the researches must be mainly on high quality authentic material especially computer-based materials with audio demonstrations which

could be utilized by teachers and learners as well as pronunciation methodology (Fraser, 2001).

Secondly, there is another issue of methodology of pronunciation teaching and question arises that "how can teachers improve the pronunciation of unintelligible speakers of English language to make them intelligible? The supporters of this approach fail to provide any proper solution of this problem. Apart from this there is no agreed-upon setting of different techniques and strategies to teach pronunciation in communicative classrooms.

2.6 Varieties of English Pronunciation Models

As variety of English pronunciation is concerned, several different varieties of English language are prevailing throughout the world; for instance, Canadian accent, New Zealand accent, Irish accent, Scottish accent etc. However, "the two best-described accents are General American (GA) and Received Pronunciation (RP)" (Bauer, 2002, p. 69).

Jenkins (2001) maintain that it seems to us that RP is not in the position to fulfill the criteria that would help it becoming as appropriate pedagogic model of EIL. She gave one solution of this problem, that Scottish or GA model could be opted as these models have fewer diphthongs and closer to orthographic links, these are certainly easier for L2 learner to acquire and understand. They also lack the negative connotations (associations) of RP. However, Bauer (2002) indicates that the different varieties of English language are based upon difference in vocabulary, grammar, pronunciation and spellings.

However, RP and GA both (native) the models are being adopted since long time (Howalder, 2011). No one can claim, that RP is the best model or GA is more convenient than RP. According to Jenkins (1998) that there must be distinctions between native norm and native model. She explains that native models should be consulted for guidance, reference and for reduction of non-native varieties and in actual sense this will lead to promotion and production of basic sounds making a closer look towards the norm of L1.

Many linguistics presented different models of (Tahreen, 2015) pronunciation, however, the modern approach focuses on comprehension and intelligibility in foreign language communication rather than native like accent or pronunciation.

Jenkins (1998) highlights that now this situation is not required anymore to teach second language learners with the purpose to communicate with native speakers only and it is also unrealistic to prepare the second language learners with this particular purpose. She further explains that ESL and EFL disparity is going to shift into EIL means English as an International language. Therefore, there is a need to prepare second language learners for effective communication skill in EIL context rather than ESL or EFL where native norms are more prioritized than communication.

Timmis as cited in Baker and Murphy (2011) conducted a survey on the beliefs about adopting native-speaker norms. The findings were based on more than 180 teachers from 45 countries and 400 students from 14 countries. Majority of the learners preferred the first option (a) to pronounce English just like-a native speaker' except the respondents from India, Pakistan and the South Africa who were in favor of option (b) to produce clearly spoken English that is mutually intelligible to both the NSs and NNSs. Likewise,

the percentage of the teacher respondents were in high ratio who were in favor of second option whether they were NS or NNS, they thought that the option was more 'realistic', despite of the fact, it was not 'desirable (p. 37).

2.7 CALL and Promotion of Learner Autonomy

Computer Assisted Language Learning (CALL) gives the way towards newly developed (1970s) notion of "Learner Autonomy" which makes the learner more and more independent as well as granting responsibility for his/her own learning. Although, since 1970s learner autonomy has been evolving in different language learning settings; however, in Pakistan this idea is not well-known. The whole world has shifted its paradigm from teacher-centered to learner centered and then again from learner centered to learning centered.

Now, the throughout the world, the only purpose of all educational endeavor is to promote learning-centered approach rather than teacher-centered or learner-centered. On the other hand, this situation is contradictory to Pakistani context, as in all public schools and in majority of the private schools, teacher-centered approach (spoon feeding) is prevailing. Learners remained passive and teacher is responsible to perform all activities without any production from learners' side. However, in Bilidi's statement paradigm shift about the learner's role;

> It has become vital for teachers to equip learners with the mechanism that enable them to adapt themselves to the changing environment, needs and realities. Autonomous learning skills are central in this direction as they provide learners

with meaningful and stimulating environment for the development of learner autonomy and promotion of autonomous learning (Bilidi, 2017, p. 10).

Basically, learner autonomy is a metacognitive approach means "to learn how to learn" (Najeeb, 2013) and "to think how to learn". Strategies and devices designed by the learner to take charge or responsibility of his/her own learning. This activity is named as autonomy. However, the term of 'autonomy' used in learning process is different from the concept of other autonomies in our life as Little points out. In fact, freedom in learning means learner has authority and autonomy to some extent not completely and this autonomy is different from autonomy in other field (Little, 1996).

In this approach, learner is autonomous to select material, can avail time (according to his/her willingness), prefer exposure (class, individual/peer, home). However, the constraint and boundaries are set by the higher authorities, administrators, stalk holders and even teacher. They set the objectives/aims, syllabus and guidelines for learners. Learners would perform under the restricted parameter to get better outcomes. Promoting autonomy through computer in language learning specially to enhance pronunciation skill has always remained fruitful. Computer as a resourceful tool provide learners very charming material and develops their thought provoking skill to be more critical (Beatty, 2010, p. 28).

Holec as cited in Little (1996) explains that learner autonomy "the ability to take charge of one's learning" to take responsibility of (learning), definition of the contents, adopting pedagogies, observations of the entire process, and assessment. (p.1). Brown (2000) elaborates that under the learner-centered, some teachers avoid to give authority to their

learners and to make them powerful, however, it is recommended that teachers must provide some sort freedom even at beginner level to make them feel autonomous and responsible for their own learning. Ceylan (2015) suggests that the main emphasis must be put on making learners more skillful and they should be well-aware of different language learning devices.

Computer is used as major component in learner autonomy and plays very important role in this regard. When learner becomes autonomous having authority and freedom while in selecting material, formulating their own objectives, planning, self-assessment, self-training, material collection such as searching the books and downloading procedure, online library, as well as get awareness to latest methodologies. Without computer technology or any other electronic device is not possible and the concept of learner autonomy cannot be flourished.

Similarly, if learners use computer to enhance their pronunciation skill, they would have access to a wide range of digital materials such as availability of different pronunciation software, web-based pronunciation learning, native models of phonetic audios, videos, usage of electronic dictionaries, cartoons, movies etc. and enable the learners to enhance their impaired pronunciation skill to increase the chance of national comprehensibility and international acceptability (Jenkins, 2001).

Pawlk (2011) discusses that "inadequacy of many of the choices and decisions made by the students, however, shows that the most crucial implication of the findings is that steps should be taken to foster learner autonomy with respect to learning pronunciation" (p. 178-179).

If pronunciation would be taught through computer as proposed in the current study, the learners would have much better chance to learn the core features of pronunciation i.e. segmental and suprasegmental as well as they would be very confidence about the usage of modern technology and other relevant devices. They would also be able to cope with their weak areas of pronunciation and could do practice with repetition for prolonged period by imitating native models. Teacher would have enough time to plan other appropriate language learning strategies according to the demands and needs of the learners. Give a man a fish and you feed him for a day, teach a man how to fish and you feed him for a lifetime (Chinese Proverb as cited in Hutchinson & Waters, 1991, p. 39).

2.8 Major Theoretical Approaches of CALL

Chun (1998) reported that in the traditional theoretical main emphasis was put on pronunciation of segmental features i.e. the individual sounds and their articulation whereas, the teaching of suprasegmental features was considered less important or even as a "luxury" item in (language) teaching. Nevertheless, the start of 1980s changed this situation and main focus was shifted from teaching segmental to suprasegmental (Morley, 1991). However, with the passage of time and by the dint of technological advancement suprasegmental got popularity such as intonation gradually acquired important place by the theoretical linguistics in second language learning and teaching.

Table 2.1

Three Stages of CALL by Warschauer, 2004

Stage	**1970s-80s Structural/Behaviouristic CALL**	**1980s-1990s Communicative CALL**	**21st Century Integrative CALL**
Technology	Mainframe	PCs	Multimedia and Internet
English-Teaching Paradigm	Grammar Translation & Audio-Lingual	Communicative Language Teaching	Content-Based ESP/EAP
View of Language	Structural (formal structural system)	Cognitive (a mentally constructed system	Socio-cognitive (developed in social interaction
Principal Use of Computers	Drill and Practice	Communicative Exercises	Authentic Discourse
Principle Objective	Accuracy	Fluency	Agency

2.8.1 Structural/Behavioristic CALL

This paradigm was initiated 1950s and overwhelmed in 1960s and 1970s and was regarded as a sub-component of enlarged field of computer assisted instruction (Warschauer & Healey, 1998). The main focus was on repetitive practice and so-called slogan "drill-and-kill". This approach got popularity in United States and computer was considered as a mechanical tutor without any exertion and learners were able to progress with their own speed. Behaviorists CALL, before it attracted towards personal computer, firstly, it was manufactured in the age of mainframe. PLATO was a well-known tutorial

system with its own specific hardware and particular features with main emphasis on drilling, grammatical interpretations and translation tests (Ahmad, Corbett, Rogers, & Sussex as cited in Warschauer & Healey, 1998). This approach granted "the more mechanical types of vocabulary grammar drill, thereby freeing class time for more expressive activities" (Hart, 1981 as cited in Levy, 1997, p. 16).

2.8.2 Communicative CALL

The emerging (Warschauer & Healey, 1998) period of this phase is the end of 1970s and start of 1980s. The behaviorist approach was rejected because of its theoretical and pedagogical bases. The invention of personal computer made it possible for the learners to do work individually. The main focus was put on teaching grammar implicitly instead of explicitly and to motivate the learners to create their own original speech and sentences rather than employing some particular utterances again and again. Furthermore, overall use of target language was greatly emphasized in this paradigm. Moreover, this approach corresponded to the cognitive theories, stressed on this notion that learning was a procedure of advancement, understanding, and innovation. Different CALL software were originated in this epoch. Well-recognized software were text reconstruction programs (which permit the learners working individually or in groups to resettle the words and texts to understand specific model of language and meaning) and simulations. It encouraged the learners towards discussion and discovery among themselves, working in groups or in pair forms).

2.8.3 Integrative CALL

The existence of Integrative CALL emerged in late 1990s with the criticism on communicative CALL which failed to utilize computer as a central element in language learning process. At that time, tendency of many teachers was to find out the ways through which more and more social or socio-cognitive approach rather cognitive paradigm should be examined along with authentic social contexts. Project-based, Content-based and Task-based are examples of Integrative CALL and the blended approach of language learning and technology. This school of thought was referred to integrative approach because it combined different skills of language learning i.e. reading, writing, listening and speaking. Apart from this, in this paradigm language learning was incorporated with technology to greater extent. Learners were taught to employ a variety of different technological tools for the procedure of language learning rather than examining the lab once a week for doing separated exercises (Warschauer & Healey, 1998).

Furthermore, Warschauer and Healey (1998) indicated that the mainframe technology was under the umbrella of behaviouristic CALL. Whereas, Communicative CALL presented the PC technology while, multimedia come under the paradigm of Integrative CALL. Moreover, they also explain that multimedia provides the learners large variety of technological tools for the purpose of publishing, getting information and communicative activities and every student would have access to those equipment. Now computer has become the major source of communication in the contemporary modern life.

However, Bax (2003) refuted this scenario of historical phases of CALL. According to him, these phases could not be considered as historical or chronological as Warschauer

and Healey (1998) themselves pointed out that these "three stages do not fall into neatly timelines. As each new stage has emerged, previous stages continue. Current uses of computers in the language classroom correspond to all three of the paradigms". Furthermore, Bax (2003) raised a question that

> If they are historical phases, how is it that all three coexist together today? And if they are not in fact closely related to historical periods, then it is surely unwise to speak of them as phases at all and to attach dates to them (Bax, 2003, p. 16).

Secondly, Bax (2003) also challenged that the term of Communicative CALL might not be appropriate to the software or utilizing the CALL in 1980s. He states that while using this term of Communicative CALL, there is no useful application except teacher deliberately made the learners indulge in communication (among themselves) beyond the technology. There was no proof that communicative CALL was not being utilized in a significant way. This thing indicate that all phases should be reassessed, with regards to their names and time span and there is need to re-examine all three phases. Thirdly, he discussed that as integrative CALL is concerned, there is not enough support to make it differ from Communicative CALL. Whereas, classroom practices and syllabus are not supported sufficiently as well.

Next, Bax, (2003) presented his own terminology on with solid reasons. He indicated that Behaviouristic CALL should be replaced by Restricted CALL. He stated that:

> The term 'Restricted' is more satisfactory since it allows us to refer not only to a supposed underlying theory of learning (behaviouristic theory) but also to the actual software and activity types in use at the time, to the teacher's role, to the feedback offered to students and to other dimensions-all were relatively 'restricted', but not all were 'behaviourist' (Bax, 2003, p. 20).

As second approach of Communicative CALL is concerned, this approach should be termed as 'Open Call' because it shows clarity and openness in all mentioned-above spheres i.e. the role of the teacher, software type and respective feedback to the learners. He further argued that although all these dimensions are not open all together, but as compared to Restricted CALL, some sort of broadness could be found in this approach. Nevertheless, its openness does not employ the openness of attitudes of the teachers, administrators and their schedules, it just indicates the open nature of technology and (wide variety of) software.

2.8.4 Integrated CALL and Normalization

To make the CALL integrated to classroom, institution or under teacher's practice, something is needed more importantly, to diffuse the concept of innovation (Rogers, 1995 as cited in Bax, 2003). Bax mentions that technology should be normalized in that sense where it become invisible. He gave examples of book and pen and states that as there is no need to pronounce their acronym such as PALL (Pen Assisted Language Learning) or BALL (Book Assisted Language Learning) because these two technologies have reached the stage of normalization. As computer technology is concerned. Again, he asserts that this stage of normalization will be possible after occurring some changes in this technology i.e. changes in size and shape and it will be utilized by every day learning scenario not only by teachers but learners as well like a pen or book. However, in the research' mind, because this article was written 12 years back now as one can see more advancement in computer technology in the shape of small sizes of laptops and tablets, mostly learners are utilizing (at home) or even latest mobile like a mini laptop.

But still computer is considered an innovative technology, still its advancement is visible and still it is far from the Bax's concept of normalization.

2.9 Diffusion of Innovations

Bax (2003) drew conclusion by giving some suggestions about CALL normalization:

1. *Early Adopters*: A few teacher and schools adopt the technology out of curiosity.

2. *Ignorance/skepticism*. However, most people are skeptical, or ignorant of its existence.

3. *Try once*. People try it out but reject it because of early problems. They can't see its value. It does not appear to add anything of 'relative advantage' (Rogers as cited in Bax, 2003).

4. *Try again*. Someone tells them it really works. They try again. They see it does in fact have relative advantage.

5. *Fear/awe*. More people start to use it, but still this is (a) fear, alternating with (b) exaggerated expectations.

6. *Normalizing.* Gradually it is seen as something normal.

7. *Normalizatio*n. The technology is so integrated into our lives that it becomes invisible-normalized (p. 24-25).

Bax (2003) believed that about using CALL in learning and teaching process, we are still at stage 5 i.e. fear/awe. Mostly teachers and instructors are reluctant to use this modern

technology of CALL, on the other hand, some consider it as a wholly solely powerful and commanding nature and give it too much awe beyond reality. However, (Cornu, 1995) defined integration theory as:

> But "integration in themselves" does not mean that new technologies are integrated in society. That is another step yet to be taken. New technologies will be integrated in society when they will no longer be a supplementary tool, added to what existed before, but when will take their place and become natural and "invisible". It is already the case for some technologies such as telephone, television and pocket calculators. Fax and "Minitel" are starting to be integrated. Computers are becoming integrated for some partial or specialized uses such as automatic bank cash, machines delivering train tickets, and some household apparatus, they but are certainly not totally integrated in society. Nevertheless, evolution is clearly moving towards an integration of new technologies in society (Cornu, 1995, p. 6).

Furthermore, Cornu, (1995) went on to say that hardware (of computer) should not be kept in specific rooms, instead those hardware should be emplaced in a usual and routine way, and without much showy display. It should be treated in the classrooms like a telephone in the house, without attracting special attention towards itself before utilizing. The integrated classrooms must be comprised of other basic devices as overhead projector, video and computer along with internet facility. A new dimension to be utilized to those material which is already available such as textbooks, there must not be additional chapters about new technology, instead the entire textbook should be dealt with new technologies.

> The issues at the intersection of applied linguistics and technology are both important for the profession and unlikely to be probed, understood, and developed by those who study either applied linguistics or technology separately. Rather it is

necessary to develop this area of inquiry through a combination of knowledge about applied linguistics and technology (Chapelle, 2003, p. 181)

2.10 Special CALL Software for Pronunciation Teaching

A large variety of experimental software applications and studies giving the notion, that how in a best way different characteristics of pronunciation software could be taught to the learners. This indicated the importance and adjustability of Computer Assisted Pronunciation Teaching (CAPT). Neri et al. (2002) opine that Computer-Assisted Pronunciation Teaching (CAPT) could be advantageous in SLA because it fulfills the learners' needs and demands by providing them a stress-free and private exposure with abundant variety of input, via Automatic Speech Recognition (ASR) and they get can personalized prompt feedback. Additionally, learners could do practice according to their own deficiencies and lacking areas for how long they want to do (without teachers' horrific facial expression or making him/her exhausted). It is also a good omen that now we have plenty of CAPT systems which are available both for the language teacher and for the individual learner as well (ibid). Levis, (2007) adds a detailed account of some software mentioned by different authors in their researches. Such as;

> General pronunciation quality (Seferoglu, 2005), speech rate, fluency and liveliness (Hincks, 2005), vowel and consonants (Lambacher, 1999; Neri, Cucchiarini & Stike, 2006a, Wang & Munro, 2004), vowel lengthening and pitch accent (Hirata, 2004a, Kaltenboeck, 2002, Levis & Pickering, 2004) and English stress timing (Coniam, 2002). CAPT seems to also work for children, if designed with that audience in mind (Mich, Neri, & Giuliani, 2006). The great majority of these studies demonstrate that CAPT, when constructed wisely, can be both

effective and flexible in addressing pronunciation instruction. (Levis, 2007, p.185).

Nowadays, CALL/CAPT are becoming more and more trendy and has gotten such importance in second language acquisition that teachers even can't think to ignore it anymore in classrooms. Although, very few studies have been done on CAPT so far, but it is also expected that in near future this CALL and CAPT programs will be prevailed in the modern society abundantly after coping some fundamental issues about its implementation, limitations, generalization and normalization. However, teachers of this modern era lucky enough because they have plenty of material available on internet to facilitate their learners.

Al-Zaidiyeen Mei and Fook (2010) indicated that 'the integration of technology in the process of teaching and learning is thought by many researchers and to increase student and teacher productivity as well as to make vast amount of information available" (p. 212). Teachers and researchers can select pronunciation software according to the demand, need and level of their learners. Apart from this, some pronunciation videos, animated movies can also be employed effectively to teach vowels and consonants and phonetics symbols to the learners of second language. Yang (2010) proposed that foreign language teachers now have access of large variety of material by which they can make the language learning process more and more pleasant for second language learners.

Now software designers are able to include in graphics, video clips, animation and sounds. More fast and powerful computers can generate the longer videos and practical sound clips. Pronunciation software are being utilized for teaching pronunciation assessment and testing. The main point to be considered is that teachers have to find out

the appropriate material and s/he must have good knowledge of phonetics and suprasegementals to use the items in digital technology to enable the learners to learn in a better way. Hua (2006) recommended that technological advancement have granted automatic speech processing (system) to increase second language pronunciation teaching and teachers are employing that advantageous pronunciation software for practice and drilling.

Eskenazi (1999) suggested that CALL program fulfills five main conditions for the effective learning: (1) learners hear large quantities of speech, (2) learners produce large quantities of speech, (3) learners receive effective feedback, (4) learners feel at ease, and (5) learners receive ongoing assessment (p. 448). Actually, currently available CALL program which give feedback to the user in the way just "Right" or "Wrong, try again" are not very helpful in real sense (Warschauer & Healey, 1998). Good software not only give appropriate feedback to the learners on their performance as well as provide remedies and solution of their problems of their wrong answer and supply some suggestions for advanced level or some additional practice at the current level or previous level.

Warschauer and Healey (1998) concluded;

> We need much work to identify the factors involved in using software effectively for language teaching. Teachers will continue to refine their techniques with CALL over time and it is hoped, continue to contribute to research being done in the area (p. 62).

2.11 Difficulties in Employing CALL/CAPT Program

Last 25 years of the previous century granted a marvelous revolution in instructional technology with diversity of audio, video, and computer competence (Morley, 1991). This revolution bestowed a very advantageous and feasible environment with regards to pronunciation teaching and to learning center laboratories.

> Researches regarding computer-assisted pronunciation teaching (CAPT) suggest that both the pronunciation teachers and researchers increasingly make use of technology to answer key questions, to ensure that claims are defensible, and to develop theories and practice that more closely match acoustic reality (Levis; 2007, p. 184).

On the other hand, there are some complications in utilizing CAPT program to improve pronunciation skill. As Levis, (2007) illustrated that there are three main barriers encountered by CAPT program, i.e. pedagogical, technological and some difficulties are belonged to teacher's preparedness. Pedagogical barrier means, that there is lack of harmony between the objectives, CAPT and the goals which are set by the current pronunciation theory and methodology. Again, he points out that there is lack of grounded theory and its implementation. Therefore, the gradual advancement and progression (in pronunciation) cannot be measured by inconsistent nature of those implications. Secondly, the technological most of the time, the failure of CAPT systems, in providing the learners a flawless and practical feedback and mechanical diagnosis of their pronunciation errors. Lastly, according to Levis, the majority of English language teachers do not have awareness to this newly established CAPT system. They are not only ignorant while using the technology as well as not having sufficient training in

(teaching) pronunciation. Levis, (2007) also suggested that teacher and software manufacturers, should have more intelligent users of CAPT.

Hardison (2004) adds that Computer Assisted Pronunciation Teaching (CAPT) has definitely positive impact over the traditional classroom instruction. Firstly, CAPT never exhaust like teacher. Secondly, there is much consistency in CAPT and it is always same in presenting its stimulus material and in feedback as teachers, most of the time, are not having this capability. Thirdly, in CAPT there is much variety both in numbers of voices used in models and in opportunities for visual feedback and finally, in CAPT there is a greater chance to fulfill the variety of individual needs more than any other teacher can do. Similarly, in learner autonomy there are greater degrees of freedom and authority for a learner, while doing practice of pronunciation skill on computer according to their demands and needs with liberty and freedom.

Neri et al. (2002) have the opinion that even though, a worthwhile criterion has been set in the past to assess CALL programs however, all these endeavors were done on general CALL program, or more even vocabulary and grammar was under focus but pronunciation (an orphan child of applied linguistics family) was again ghettoized by the CALL application also and no specific standard or parameter have been set so far.

As Pennington (1999) postulates that, majority of the pronunciation software focus on decontextualized robotic articulation. Some other software inspire the teachers and learners by their novel appearance of software through computer, however, in reality they do not fulfill the linguistic requirement (Derwing & Munro, 2005; Chun, 1998).

> A wide range of tools and approaches now exists in CALL but it is not always clear how those tools are selected, adapted, developed, implemented and evaluated in teaching contexts. By looking at the use of CALL in one type of pedagogical environment we can again insight into which tools are favored in practice and which approaches to learning and teaching they support. (Zhang & Barber, 2008, p. 470).

Neri et al. (2002) and Chun (1998) have the opinion that extensive variety of CAPT software, seemed good apparently, but in fact, the graphic wave forms displayed in software do not exhibit meaningful production for learners. Suffice it here to say (Pennington & Stevens 1992) that language learning and teaching have changed the paradigm shift from behaviorists to humanistic approach, Consequently, now CALL is widely accepted device and becoming more 'user-friendly' They further proposed that:

> It is argued here that, in shaking off the influence of the early behaviorists, CALL is becoming more 'user-friendly', or humanistic. Whatever its precise manifestation, humanism in CALL means that course ware lends itself these days more to what students want it to be than what a particular program designer may have originally intended it to be. This watershed development has not only brought CALL more in line with current thinking about language teaching methodology, but also heralds the emergence of CALL as a versatile tool, as an aid to learning, and as an informant on language rather than a preceptor, task-master, or programmed instructor (Pennington & Stevens, 1992, p. 11).

2.12 Summary

Putting into nutshell, this chapter highlights the different aspect of pronunciation along with existing literature. The literature provides an in-depth account of theoretical

foundations in relation to dependent and independent variables of the current research. As cognitive theory presents 'processing model' and 'connectionism'. Socio-cultural theory proposed the idea of zone of proximal development (ZPD) and Audio-lingual model (ALM) is promoted by behaviorism theory. All these theories and models support the hypotheses of the current research. For example, according to the processing model and connectionism of cognitive theory, in this study, computer was used as digital device to utilize the different channels (phonological, visual and auditory) of the brain collectively to get better performance in learning of phonemic sounds. Next model, ZPD devised by socio-cultural theory that model provided the grounds for this research, computer used as 'mediator' and 'scaffolding assistance, to increase the learners' current level of 26 letters toward the expected level of phonemic sounds. Additionally, learners got the approach of 'metacognition' (socio-cultural theory). Through this study, learners especially the participants of Experimental Group 1 realized their deficiency of pronunciation. They started to think and learn symbols and sounds of pronunciation after this realization. As before this, from grade 1-10 they were not trained the pronunciation in this way. Lastly, audio-lingual method (ALM) proposed by behaviorism theory encouraged the learners to listen the pronunciation of IPA sounds on CALD, imitate and repeat the material again and again.

Moreover, this chapter also discusses the previous empirical researches regarding learning and teaching of through different CALL software. Some new trends have been prevailing in the research area of language learning which promotes to cope with the demands of 21st century. Such as intelligibility and comprehensibility got priority by the current researchers and linguistics and now accuracy is no more is the requirement of

second language learning. It also highlights whether native like pronunciation is required or intelligibility and comprehensibility of pronunciation must be maintained in second language learning process. Different varieties of English pronunciation which are considered as norms and standards are delineated in this chapter. Additionally, in this chapter computer assisted language learning, different CALL approaches and learner autonomy in CALL context all are illustrated in this chapter. After summarizing the literature, the gap of the study is also portrayed in this chapter. Major approaches of CALL, some difficulties and limitations in employing CALL/CAPT all are dealt in this chapter.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter delineates all the techniques and methods for conducting the current research. It describes the research procedure in detail, i.e., rationale for adopting quantitative approach, research design, justification for research design, population, sample size and research procedure and all instrumentations employed in this study. It highlights the data analysis tools to measure the statistical data obtained by the current research. Additionally, this chapter also explains the procedure of piloting the data, reliability and validity of the findings as well.

3.2 Research Paradigm

In conducting a research, a researcher has some expectations and assumptions according to the nature of the problem which directs the researcher what sort of paradigm would be applicable in respective research (Kanire, 2012; Chilisa & Preece, 2005). Apart from other variety and subtypes of research methods, there are two main types of approaches such as qualitative vs quantitative. Dornyei and Ushioda (2011) highlight that the quantitative research is a "systematic, rigorous, focused and tightly controlled involving precise measurement and producing reliable and replicable data that is generalizable to other contexts" (p. 203). Additionally, Dornyei and Taguchi (2010) identify that quantitative approach is rather quick and supplies valuable response in regard to money

and effort as well as it is more able to retain its illusion of being objective, value-free, scientific and valid (Walford, 1998).

Quantitative paradigm sometimes, directs a researcher to find out the cause effect relationship between two or more dependent and independent variables. Researchers can opt causal comparative research if the research problems are related to the past, in which researcher's task is just to analyze whether relationship exists between dependent and independent variables without any control over the variables (Salkind, 2010; Randolph, 2008). On the other hand, if a researcher wants to examine the cause effect of some variables in current situation, then experimental research offers more reasonable choices (Muijs, 2010).

Experimental research is the most demanding and the most productive type of quantitative research. When it is conducted, experimental studies produce the soundest evidence concerning hypothesized cause-effect relationships (Gay et al., 2012). Since, the nature of this study was also to examine the cause effect relationship in the current scenario. That is why; true experimental research was selected rather than causal comparative to evaluate the effect of computer on pronunciation of secondary school learners in Pakistan. Gay et al. (2012) called it laboratory experimental research. It investigates whether a special treatment affects the results (Creswell, 2014). True experimental research is a type of research in which randomization of subjects is conducted for the purpose of treatment. Whereas, quasi experimental research lacks this randomization feature (Keppel, 199). Creswell (2012) mentioned that there are some essential steps while conducting an experimental research. He elaborates that there must be (1) randomization of the variables (2) control over extraneous variables (3)

manipulation of the treatment conditions (4) outcome measures (5) threats to validity (p. 296).

3.3 Population

Gay et al. (2012) suggest that populations could be of any size and any geographical area depending upon the problem or area of interest. It is very difficult for a researcher to include the entire group of interest for a particular area of research (Beatty, 2016). To solve this problem, two types of population is conducted, i.e., accessible population and target population. Accessible population in which a researcher takes an individual or cluster of people which is convenient and accessible for him/her, as a subgroup of a target population. Whereas, target population is consisted of individual or people to which s/he wants to generalize the results of study (Johnson & Christensen, 2013; Gould, 2001).

Since, the topic of current research is "The effect of Computer Assisted Language Learning on English Language Learners' Pronunciation in secondary school in Pakistan". Pronunciation problem is a nation-wide problem throughout the Pakistan. As Shazada (2012) indicated that pronunciation skill is ignored throughout the country and very few Pakistani have this ability (pronunciation) to understandable level. (Hussain, 2012; Jabeen, 2013; Rahman; 2014; 2005; Chandio et al. 2013; Shahzada, 2012). So, to conduct this study, it was not possible for the researcher to approach target population.

Therefore, the current research went through the process of accessible population to evaluate the said hypotheses. As the purpose was to examine the effect of computer on pronunciation, vowel and consonant sounds of secondary school learners. All secondary school learners of the Government High School Tehsil Hasilpur (old), District

Bahawalpur, Punjab, Pakistan were5 taken as a population of the study. It was a semi urban region of that district having homogenous characteristics of the public schools to the target population because all Pakistani public schools have same objectives, aims, mythology, contents and evaluation system at secondary level (Aamer, 2009).

3.4 Sampling

Sampling is defined as a course of action through which selection of a subgroup of a population is carried out with the probability of representativeness of the entire population (Gay et al., 2012). Moreover, "sampling is a useful short cut leading to results that can be almost as accurate those for a full census of the population being studied but for a fraction of the cost" (Gorard, 2001, p. 10).

In this research, the systematic random sample was performed. The entire population was elected as all were female learners of 10^{th} grade in a public high school of Tehsil Hasilpur, (old) District Bahawalpur, Pakistan. The population was consisted of 300female high school graders in semi-urban region. Their ages were 14-16 years, enrolled for matriculation degree (2015-16). In Pakistan, English is taught as a compulsory subject and all the respondents had equal proficiency level of English language as they have studied English (as subject) for 10 years from grade 1 grades 10) (Waseem & Jibeen, 2013).

All participants had same social status because all belonged to a semi-urban town. Moreover, all respondents were average English language learners because the only learners who pass their 8^{th} grade exams with at least 70% marks are allowed to get

admission in 9th grades. However, this result was overall performance in all subjects. For the purpose of examining the actual level of English proficiency, researcher got previous record of their cumulative grades in English subject; they all got scores around 60% - 70%, as average in English. On the other hand, as spoken aspect of English competency is concerned, they all were very poor. There was no single student who could speak one or two sentences in English. That is why, researcher taught both the groups few introductory sentences during the treatment on principals' special request, however; it was not included in the research plan.

Mean scores of the pretest confirmed the homogeneity level of all participants. The participants of Experimental Group 1 got means score 121.57 while experimental group 2 showed means score of 118.22 with p value of .214 that means this difference was not significant numerically and all learners had the same capability of pronunciation sounds.

3.5 Sampling Procedure

The respondents were selected on the basis of systematic random sampling using a table of random numbers. Systematic sampling is "a modified form of simple random sampling" (Cohen et al. 2007, p. 111). The detailed procedure of sampling is discussed in the following. Systematic random sample was adopted by the researcher in the current research to get the required sample size. As the formula discussed by Cohen et al. (2007) is that the total number of the population is divided by the sample size required to get frequency level.

$$f = \frac{N}{SN}$$

f = frequency interval

N = the total number of the wider population

sn= the required number in the sample.

To find out the frequency interval in this research

$$\frac{300}{70} = 4.28$$

Frequency level=4

It means that the frequency interval is 4 as every 4th number student from the complete list of table number was taken out as s systematic sampling. Nevertheless, one problem could be aroused while selecting the sample by this systematic formula, there is a possibility that everyone does not have opportunity to be selected for sample. For instance, Cohen et al. (2007) gives example and states that if suppose, frequency interval is 5, in this method, the names 1-4 and 6-9 will be expelled, that means everybody does not have the equal chance to be selected for a sample of that specific population. That is why, to reduce this issue a researcher must propose random assignment for the initial listing and starting point rather than systematically. In current research, the researcher also followed this formula, and randomly starting point was 25 and then every 4th student from the entire list of the population. Whereas, if the formula would be followed by systematic sampling then starting point was to be selected as 4 instead of 25 having less chance for everybody to be selected from the entire population. Next the sampling was performed by random sampling. Randomization is employed to avoid biasness in a research procedure (Kumar, 2011).

After selecting the required respondents from the list. They were divided into two groups by drawing the names of the participants from a container one by one. The names of all

participants were written on small pieces of paper, folded, jumbling down all the papers and finally all small pieces of papers were put in a container and then took out one by one. For instance, first name taken out of the container was included in Experimental Group 1 and the 2nd name gotten out of the container was added to Experimental Group 2. Then again 3rd participant was given the name of Experimental Group 1 and 4th one was the participant of Experimental Group 2 and so on. Therefore, flip of the coin was used to decide which group would be Experimental Group 1 that was given the innovative treatment and which group would be Experimental Group 2to teach pronunciation through the traditional method. So, flip of the coin, (head or tail) was used to decide the type of treatment given to both the groups (Gay et al., 2012; Cohen et al., 2007).

3.6 Rationale for Sample Size

As the current study was an (quantitative) experimental research in a nature so, it could be argued here that an experimental research is a different type of research as compared to the other types of quantitative researches such as descriptive or any survey research, as large size of sample is required in such kind of researchers through which a researcher has to pull the prevailing trends and norms from an expanded area, or any specific regions about a particular phenomenon. Therefore, in descriptive researches a large size of sample is preferred for generalization because there is no issue of controllability of dependent variables. Whereas, in an experimental research a small size of sample is taken for research because large size of sample is not possible even it is not required in this research, because of the issue of controllability of this type of study has to be matched with the situation where these similar circumstances or situation would be created

according to this research. Cohen et al. (2007) interpret that the most important thing for positivists researchers is controllability, isolation and randomization of the variables. Positivist researchers, "they are more concerned in deriving universal statements of general social processes than statements of commonality between similar settings such as classrooms" (Bogdan and Biklen, 2007, p. 36). Again, Bogdan & Biklen, (1992) argue in the same way by stating that here (quantitative settings/experimental) the main concern is not with the question whether the obtained findings are generalizable, but rather with the question to which other people and situations they are generalizable (Bogdan & Biklen, 1992).

Different experimental researches have been conducted while taking small sample size in their respective studies. For instance, Papchristou (2011) took the sample size of 15 learners for his experimental research. Additionally, Beinhoff (2014) selected only 8 participants to perform his experimental research, dividing them into two groups. Kim used sample size of 36 respondents whereas, Gordon, Darcy, and Ewert (2012) chose the sample size of 20, 10 participants in each group. Abshire (2006) used the sample of 28 participants by dividing them into two groups, 14 in each case. Likewise, Saito (2011) performed experimental research taking the sample of 20 respondents forming two groups of 10 in each group.

3.7 Justification for Selecting the School

Government High School Tehsil Hasilpur (old), District Bahawalpur, Punjab, Pakistan was selected as convenient population because of involving the phenomenon of

approachability regarding selecting institution. This particular approachability issue was partially in the terms of distance (It was quite near to the researcher' own locality) and partially because of good relationship with the principal of that school. First meeting with principal of the high school was conducted regarding introduction and the purpose of the study, duration; allocated time and level of participants were all discussed in the first meeting. In second meeting the consent form was signed by the principal. Whereas, in third meeting researcher met with respective teachers who were teaching English the class 10th. At that time, all classes were busy in their internal exams (school level) so, the researcher had to wait for one week more to initiate the actual research plan.

3.8 Informed Consent of the Participants

Prior to initiate the research, informed consent (Appendix F) was obtained from the principal of the school. "Informed consent includes participants' understanding that they have the right to withdraw from the research investigating at any time, and their freedom to exercise that right" (Gall, Gall & Borg, 2003, p. 71). In addition, they further explain that if the participants are school children, consent form must be filled by the main caretaker (usually parents) or school administration. As the participants for the current study were school children, the consent form was filled by the school principal. "If the learners are young school children researcher must approach adults for prospective respondents; for instance, parents, teachers, tutors, psychiatrists, youth leaders or team coaches depending on the research context" (Cohen et al., 2007, p. 54). Therefore, the school principal signed the consent form on behalf of all the participants. Additionally, all the participants were assured that they would not be harmed in any way and identity

and reputation of the participation would be very confidential. The researcher also explained that the data would be used only for research purpose and research publication without mentioning their actual names.

Table 3.2

Pre and Post Activities of Research Plan

N	Days & Dates	Activities
1	Monday, December 5th, 2016	First meeting with the principal of Government Girls High School, Tehseel Hasilpur (old)
2	Tuesday, December 6th, 2016	Consent form was signed by the principal
3	Thursday, December 8th, 2016	Final decision regarding participants and timing of both the groups to be taught by the researcher
4	Thursday, December 15th, 2016	Pretest (Experimental Group 1)
5	Friday, December 16th, 2016	Pretest (Experimental Group 2)
6	Thursday, January 26th, 2017	Posttest (Experimental Group 1)
7	Friday, January 27th, 2017	Posttest (Experimental Group2)
8	Saturday, January 28th, 2017	Interview the participants of Experimental Group 1

3.9 Research Design

The Pretest Posttest Two Treatment Design

The pretest posttest two-treatment design of a true experimental research was used to implement the research plan (Cohen et al., 2007).

The schematic representation for this design is:

Experimental 1RO1X1O2

Experimental 2RO3X2O4

(Cohen et al, 2007, p.278)

According to Cohen et al, (2007) schematic representation indicates;

- *X* symbolizes the treatment, event or effect that is given to the experimental group to see the result of manipulation
- the term *O* is used to express the procedure of observation
- Left to right sequence shows temporal (time related) order
- *Xs* and *Os* vertical to one another are simultaneous
- *R* symbolizes random assignment to divide treatment groups (Cohen et al., 2007, p. 275).

According to the schematic representation, two groups were selected randomly in the current research (Shown in Figure 3.1) Experimental Group 1 and Experimental Group 2. Both the groups (Experimental Group1 and experimental Group 2) were selected randomly by using a table of random numbers (Gay et al., 2012). Both the groups were taken the pretest to find out the current proficiency level of English phonemic sounds (Cohen et al., 2007). Experimental Group 1was assigned innovative treatment as they were taught phonemic sounds through phonetic videos and CALD whereas, Experimental Group 2 was taught pronunciation through traditional method.

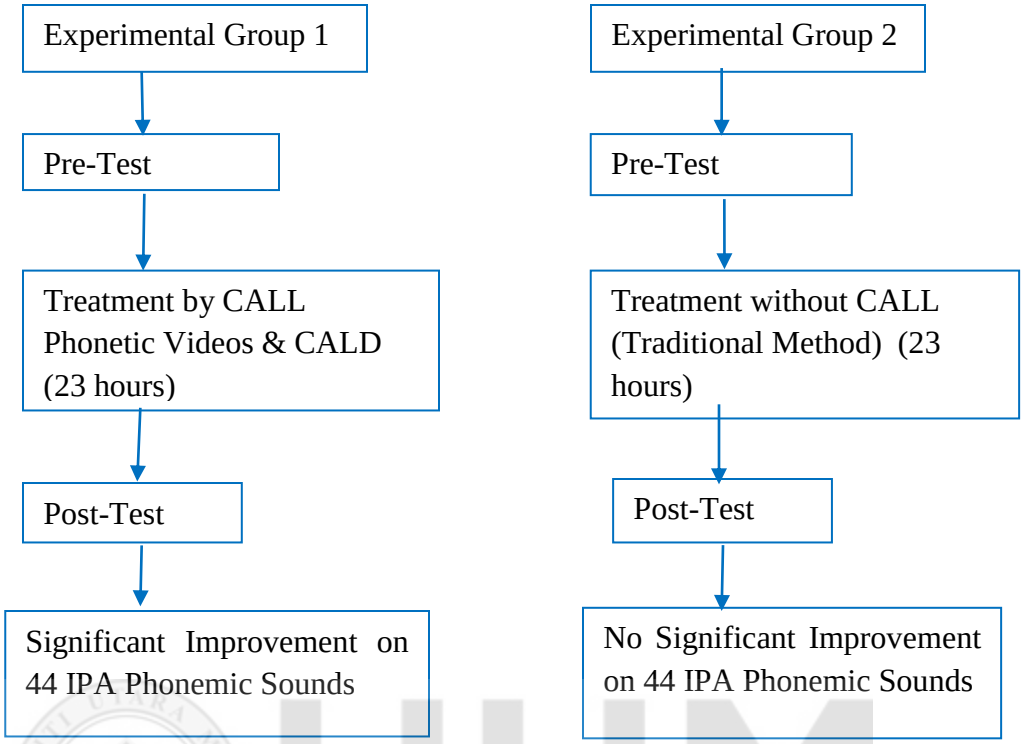


Figure 3.1 Research Design of the Current Research

3.10 Justification for the Research Design

Research design is defined as an overall activity or plan to measure the hypothesis and answer the research questions (McNabb, 2015; Aparasu & Bentley, 2014). It is also explained by researchers as outline and course of actions which deals with the formation of groups, identification of dependent and independent variables, controllability of the internal and external variables as well as structuring the data collection and data analysis tools for the groups of a proposed study.

Finally, after the treatment of 46 hours (23 hours per each group) both the groups were posttested and a significant improvement was found in the mean scores of the posttest of

Experimental Group 1. Whereas, no significant improvement was observed in posttest of Experimental group 2.

True experimental research paradigm was selected for the current study because; it is “the ideal design collects a maximum amount of information with a minimal expenditure of the time and resources” (Tayie, 2005, p. 19). This is called a true experimental design and Kerlinger as cited in Cohen et al. (2007) named it as a ‘good’ design. Muijs, (2004) elaborates that “a test under controlled conditions that is made to demonstrate a known truth or examine the validity of a hypothesis” (p. 13).

Additionally, all the key features of true experimental research were included (Cohen, et al., 2007) in the current research as it was also comprising of two experimental groups, i.e., Experimental Group 1 and Experimental Group 2, both the groups were selected randomly, after that the pretest a was given to both the groups and then Experimental Group 1 was given an innovative treatment and Experimental Group 2 was exposed to the traditional method to compare with the effect of novel treatment on experimental group. Gay et al. (2012) denote that "the pretest-post-test two treatment design" is reliable for reducing the ambiguities in the study (Gay et al. (2012).

Another reason behind choosing this ‘pretest-posttest two treatment design’ research design was that sometimes there are ‘reactive arrangements’ could be the cause of the internal validity of the study. Reactive arrangements occur when participants of experimental/innovative treatment consider themselves superior and they are getting special treatment. This type of attitudes of can affect the findings of the study. It is also called "hawthorne effect" (Khurana, 2009). Similarly, the current research was also

concerned with another participants' effect which was novelty effect. In novelty effect participants are more motivated and their level of interest becomes high, thinking that they are doing some innovative, special and out of routine (Gay et al., 2012, p. 261). They have the opinion that in this way, there is a possibility, that given treatment might be effective just because of the fact that it is different not because of its being better option. Thus, to decrease the novelty effect researcher must try to do experimentation for long enough particularly when treatment is absolutely different from the traditional one.

Importantly, in the current research, there were complete 23 sessions of 1 hour for teaching of 44 IPA sounds for each group (total 46 hours for both the groups) to perform better and to show what is the actual effect rather than novelty effect. To lessen the novelty effect the participants were masked their identity of the treatment as they did not know whether they were the part of Experimental Group 1 with special treatment or the Experimental Group 2 with ordinary treatment. That is why, in the current research the single blind control trial approach was under consideration. This actual plan was only confined to the researcher herself and even their respective teachers for Experimental Group 1 and Experimental Group 2 (who attended both the sessions of treatment with their learners) were not aware of these two types of treatment (Singh, 2007).

Reactive arrangements also can motivate the participants or instructors of Experimental Group 2 realizing the challenging circumstances and they become energetic and outperformed Experimental Group 1. This effect called "John Henry effect" (Riazi, 2016; Paulson, 2014). To reduce the both the effects, i.e., 'Hawthorne effect' and 'John Henry effect' in pure experimental research, the researchers like Gay et at. (2012) presented the idea of 'Placebo effect'. This term is used in medical sciences. In placebo effect half of

the subjects of an experiment get the true medication while rest of the participants are given a placebo (just sugar and water) without informing the subjects as they consider that they are taking the real medicine. Likewise, in the current research, both the groups experimental 1 and experimental group 2were given treatment, without knowing the nature of the treatment given to both the groups. Experimental Group 1 was also exposed to innovative CALL treatment whereas, Experimental Group 2 considered that Experimental Group1 was also treated traditionally. They were not informed about the CALL package.

The Hawthorne effect is defined as the tendency of human beings to temporarily improve their performance when they are aware it is being studied, especially in a scenario where they think they have been singled out for some experimental treatment. The placebo effect refers to the tendency of some subjects to respond positively to a new treatment just because they expect it to work, although the treatment may be entirely ineffective (Singh, 2007, p. 67).

Another reason for selecting the pretest and posttest two treatment design was that both the groups of a research receive special treatment while in experimental and control group design, the experimental group receive special treatment while control group receive nothing. It can be said that if one group is not given treatment then how it could be said that particular innovative treatment made a significant difference on dependent variables compared to the traditional treatment. Might be the change occurred do to maturation.

3.11 Piloting the Data

Apart from the actual participants, another sample of 20 learners (from the same population) was selected for the purpose of piloting the data. The selected sample was similar to the target participants regarding proficiency level of the English language, their age, background knowledge and they all belonged to the same population. Pilot treatment was kept for three sessions to check the accuracy of instrumentations. Two sessions were employed to teach phonemic sounds through digital material. Pilot study was conducted on the subjects with the same pronunciation test items included in the pretest. However, the posttest pronunciation test items were not piloted. The purpose of the piloting the data was to ensure that all the equipment were ready to use for actual experimentation without any distraction and inconvenience (Creswell, 2014).

Table 3.1

Scale Statistics for Reliability Coefficient

Cronbach's Alpha	**Mean**	**Variance**	**N of Items**	**N of participants**
.736	146.20	227.958	44	20

No of Participants=20 Alpha .736

The purpose of the pilot testing (Appendix D) was to observe the accuracy of the instrumentation prior to the actual procedure of the experimental research. Secondly, by conducting pilot data, it was also aimed at to check the reliability and validity of the test items. The Cronbach's Alpha was utilized to examine the consistency of the test items. The Cronbach's Alpha was tabulated to find out the coefficient value that must show the

value between 0-1. The value of Alpha for this pilot study was .736, which is acceptable indicating that the scale has internal consistency and that is why it could be a reliable test.

3.12 Content/Face Validity of Pronunciation Test

The issue of content validity was justified on the bases of including all the content items in the pretest as well as posttest (Kothari, 2004). Thus, the pronunciation test containing all phonemic sounds would be valid in the content and items for the purposes of study. Creswell (2014) highlights that instrument developers (must) consult panel of experts to make sure whether the test items are valid (Dornyei, 2007).

However, in this research the process of content validity and face validity of the instrumentations was done by two senior professors of Institute of Education and Research at University of the Punjab, Lahore (Pakistan). They performed the task on the researcher's special request. The researcher had to travel miles away to visit those two experts. Since the purpose was to show the test and to perform face to face meeting and discuss with them all about the instrumentations personally. Some amendments were made according to the experts' views. For example, initially for the posttest of pronunciation some items were selected which were very difficult as compared to the pretest's items. Then, the difficulty level of both the tests was equalized on experts' recommendations by replacing the difficult words by rather easier ones. Secondly, the researcher chose 30 items instead of 44. However, the experts suggested to include all the items required items means all 44 IPA sounds were included in the pretest and posttest.

Table 3.2

The Representation of Segmental Sounds in the Pronunciation Test (pretest)

No.	*Segmental Sounds*	*Items of the Test*	*Sounds of the Items*
1	iː	me	/miː/
2	ʊ	look	/lʊk/
3	ʌ	up	/ʌp/
4	ɒ	on	/ɒn/
5	ə	uh	/ɜː/
6	e	ten	/ten/
7	æ	hat	/hæt/
8	uː	shoe	/ʃuː/
9	ɑː	arm	/ɑːm/
10	ɔː	saw	/sɔː/
11	ɜː	turn	/tɜːn/
12	iː	in	/ɪn/
13	ɪə	ear	/ɪə ʳ/
14	ʊə	poor	/pɔː ʳ/
15	ɒɪ	eye	/aɪ/
16	ɔɪ	noise	/nɔɪz/
17	əʊ	nose	/nəʊz/
18	eə	hair	/heə ʳ/
19	aʊ	ow	/aʊ/
20	eɪ	pay	/peɪ/
21	p	pop	/pɒp/
22	t	two	/tuː/
23	tʃ	church	/tʃɜːtʃ/
24	k	cake	/keɪk/
25	f	fan	/fæn/
26	θ	three	/θriː/
27	S	six	/sɪks/
28	ʃ	shoe	/ʃu /
29	b	bus	/bʌs/
30	d	dog	/dɒg/
31	dʒ	jam	/dʒæm/
32	g	good	/gʊd/
33	v	very	/ˈver.i/
34	ð	the	/ðiː/
35	z	zoo	/zuː/
36	ʒ	pleasure	/pleʒ.ə ʳ/
37	m	man	/mæn/
38	n	nine	/naɪn/
39	ŋ	wing	/wɪŋ/
40	i	happy	/ hæp.i/
41	l	like	/laɪk/
42	r	red	/ red /
43	w	wind	/wind/
44	j	yes	/jes/

So, all the amendments proposed by the experts were followed by the researcher. Finally, both the researchers showed their full consent towards the instructional material to be launched for the current research.

3.13 Internal Validity

Two raters were hired to score the Likert scale for pronunciation test in the pretest (Appendix B) and posttest (Appendix C). Both the professors were of linguistics and before scoring the data, both the raters were trained and given clear instructions about the criteria of scoring in the pronunciation test. Both the raters were given a written version of the test in the pretest and posttest. The target sounds were also written with the word list in front of every word to identify whether the participants pronounce the sounds accurately or inaccurately.

Likewise, rater No 1 was asked to rate the data in the pretest and posttest of Experimental Group 2 and the rater No 2 was requested to assign scores in the pretest and posttest of Experimental Group 1. Rater No 2 was not informed about the digital teaching of pronunciation sounds to get more accurate findings of the posttest results to mitigate the Hawthorne effect. The purpose of randomization of the participants as was to reduce the threats to the internal validity. The raters were instructed, they must stop the scoring, if they would have exhausted during the scoring procedure.

Additionally, same instructor and same material for the same duration were provided to both the groups to minimize the biasness in experimental research. There are some researchers, in which participants of the group w were not given treatment. To minimize

the threat to internal validity, in the current study, the researcher provided treatment to both the groups. However, the only difference was in practice sessions due to the nature of the research plan. As Experimental Group 2 was taught in the traditional classroom whereas, Experimental Group 1 was given treatment in the computer lab. This difference was indispensable to see the difference of CALL methodology to teach pronunciation sounds.

Moreover, to evaluate the consistency in the research plan, all procedure was followed by the same sequential steps. It means pretesting of both the groups were administered in the same environment as well as treatment of both the groups at the same time with same material (in pretest & treatment) followed by the pretests procedure for both the groups. Then to control the subjectivity and biasness and to get more accuracy and better results in Likert scale based pronunciation test was administered (Shams, 2006). Additionally, the researcher tried to minimize the Hawthorne effect as Experimental Group 2 was given some kind of traditional treatment.

3.14 Research Procedure

To achieve the research objectives of the study and to investigate the "The Effects of CALL on secondary school English language learners' pronunciation in Pakistan" the following research tools were used:

1. Pronunciation Test (for pretest & posttest)
2. 5 Phonetic Videos (for treatment plan)
3. Cambridge Advanced Learner's Dictionary (for treatment plan)

3.14.1 Pronunciation Test (pretest and posttest)

Phonemic chart was employed as pronunciation test. However, instead reading symbols, participants were asked to read the words to identify the vowel and consonant sounds. The pronunciation test was consisted of 44 words (Figure: 3.2). Hirata (2004) also used 21 words instead of phonemic symbols to evaluate the pronunciation sounds of the learners. A written test was shown to all the participants of Experimental Group 2 and Experimental Group 1 one by one and then they were asked to pronounce each word clearly and loudly. The voices of all 70 participants were recorded by a voice recorder before and after the experimentation. The purpose of the recording was to evaluate and make the participants' production more meaningful while interpreting on Likert scale.

Monophthongs				Diphthongs		
Me	Look	Up	On	Ear	Poor	
/i:/	/ʊ/	/ʌ/	/ɒ/	/ɪə/	/ʊə/	
Uh	Ten	Hat	Shoe	Eye	Noise	Nose
/ə/	/e/	/æ	/u:/	/ɒɪ/	/ɔɪ/	/əʊ/
Arm	Saw	Turn	In	Hair	Ow	Pay
/ɑ:/	/ɔ:/	(ɜ:)	/i/	/eə	/aʊ/	/eɪ/

Consonants					
Pop	Two	Church	Cake	Fan	Three
/p/	/t/	/ʧ/	/k/	/f/	/ɸ/
Six	Shoe	Bus	Dog	Jam	Good
/s/	/ʃ/	/b/	/d/	/ʤ/	/g/
Very	The	Zoo	Pleasure	Man	Nine

/v/	/ð/	/z/	/ʒ/	/m/	/n/
Wing	Happy	Like	Red	Wind	Yes
/Ŋ/	/h/	(l)	/r/	/w/	/J/

Figure 3.2 Pronunciation Test (used as pretest)

In majority of the previous researches, pronunciation software like Praat, Pronunciation Power-1, Pronunciation Power-2, Talk to Me' MyET, Mounton and many more were used to evaluate the segmental and suprasegmental features of participants. However, in the current research, the researcher did not use these software deliberately, instead she used human raters to analyze the speech sounds on 9-point Likert scale as machines cannot perform better regarding human speech sounds. Murray (1995) points out that such machine based (digital software) programs have some constraints. He continued to say, "for machines to understand and produce language, they must be able to process natural language at the morpho-syntactic, semantic and discourse levels. For spoken language, the system also needs to process language at the phonetic and phonological level" (Murray, 1995, p. 146). Chun (1998) also points out that there are some problematic areas, when we use computer software for raw acoustic analysis (Neri et al. (2002).

However, in the pronunciation test of the posttest some words were altered with the same difficulty level. For example, first word 'Me' having long sound of /i:/ was replaced with the word 'Read' to identify the same long sound of /i:/. Some other words were also replaced according to this rule in pronunciation test of the posttest.

3.14.2 Phonetic Videos to Teach IPA Phonemic Sounds (as a treatment plan)

Five phonetic videos were selected as treatment for this research project. Three videos were in female voice whereas the rest of the two videos were in male voice. First video was consisted of 12 (monophthongs) vowel sounds while the second video was about diphthongs (double sounds) and video No 3 was comprised of consonant sounds. As Pakistani learners have much difficulty regarding vowel sounds, two more videos regarding vowels sounds (single and double sounds) were added in this plan. As video No 3 and 4 having male voice for additional practice of the vowel sounds. Rasheed (2014) used computers and videos along with photos and newspapers. for EFL Arab learners who were studying at University Utara Malaysia. Rasheed found that the participants of the experimental group were more confident and enthusiastic regarding usage of tenses and they improved their speaking skill of English language. He performed pre-test, posttest and structured interview for participants of both the groups. The duration of the study for treatment was 18 hours.

3.14.3 Cambridge Advanced Learner's Dictionary (CALD)

This dictionary exhibits both the pronunciation accents, i.e., British and American. British accent UK is represented by red speaker whereas American accent is shown by blue US speaker. Having a feature of digital voice, it allowed the learners for the computerized word searches. The subjects liked the idea to listen the pronunciation in both the accents, i.e., British as well as American accent. The front cover of the dictionary is shown in the following (Figure 3.3)

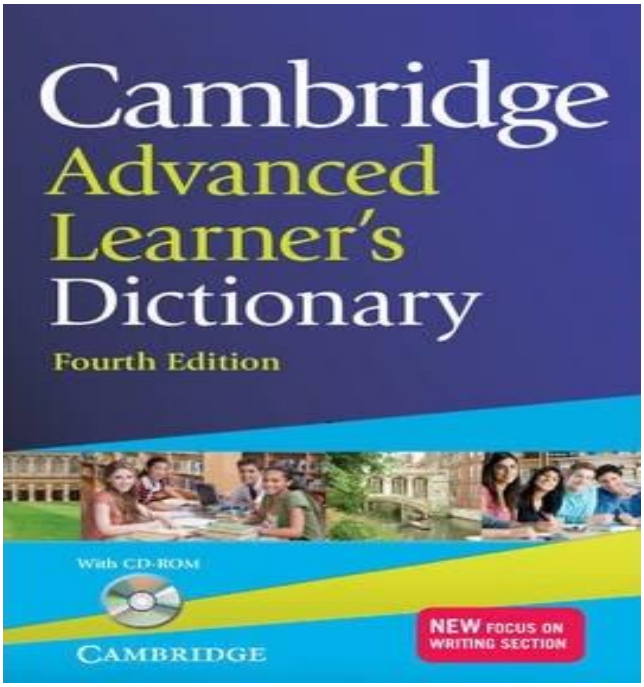


Figure 3.3 An image of Cambridge Advanced Learner's Dictionary

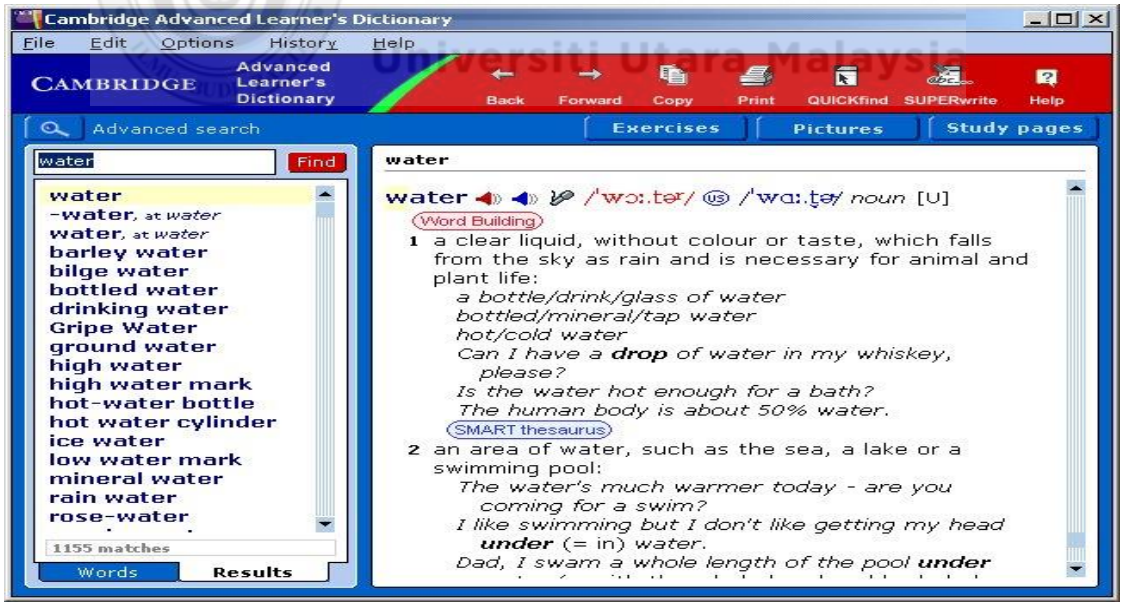


Figure 3.4 An image of word 'water' in CALD

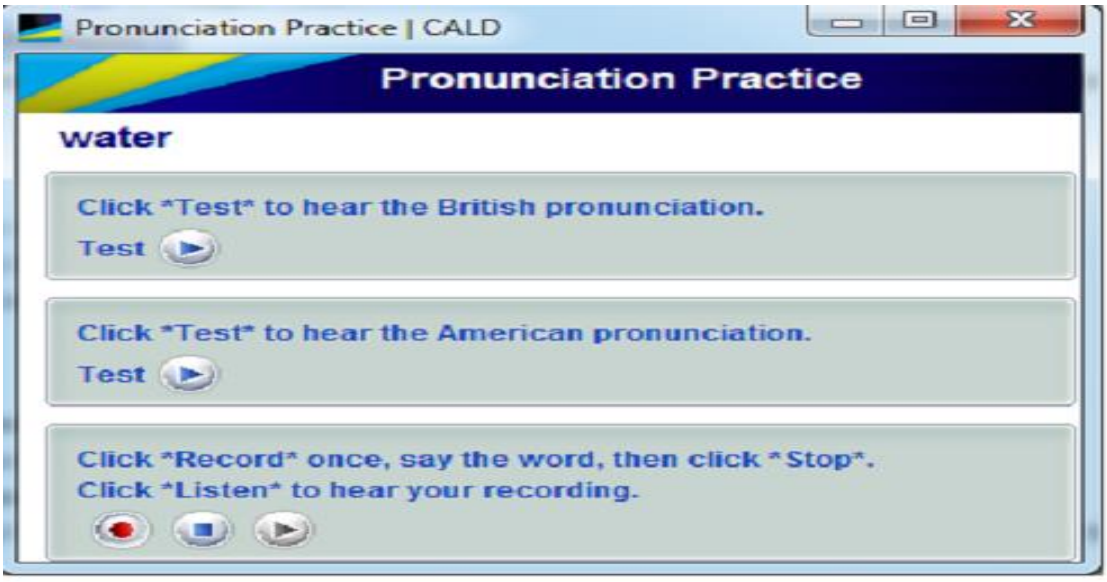


Figure 3.5 An Image of Recordings of the Learners' Own Voices

In addition, the subjects could record their own voices while pressing the microphone icon, / /as well as picture is also shown to describe the words more clearly. However, very few words are shown with pictures and majority of the words have no picture display. The subjects found it very useful to enhance their pronunciation skill especially the sounds. These days' digital dictionaries are becoming more attractive, popular to EFL learners (Zheng & Wang, 2016).

The main feature of CALD, is search bar where the learner can type the word which s/he wants to search and then click on 'find' button. Definition of the word is written on the right side of the window with the phonetic transcription along with the stress mark and the British and American pronunciation. It is very useful tool for the second language learners. They could do practice and record their pronunciation test buttons. Two signs of buttons as there is written click 'test' to hear the British accent and click 'test' to hear the American accent. After clicking on the 'test' button, a learner can click on the record

button for recording the voice of his/her own pronunciation, then by clicking the button 'listen', s/he can do comparison of his/her voice with native model (Kumar & Madhavi, 2012).

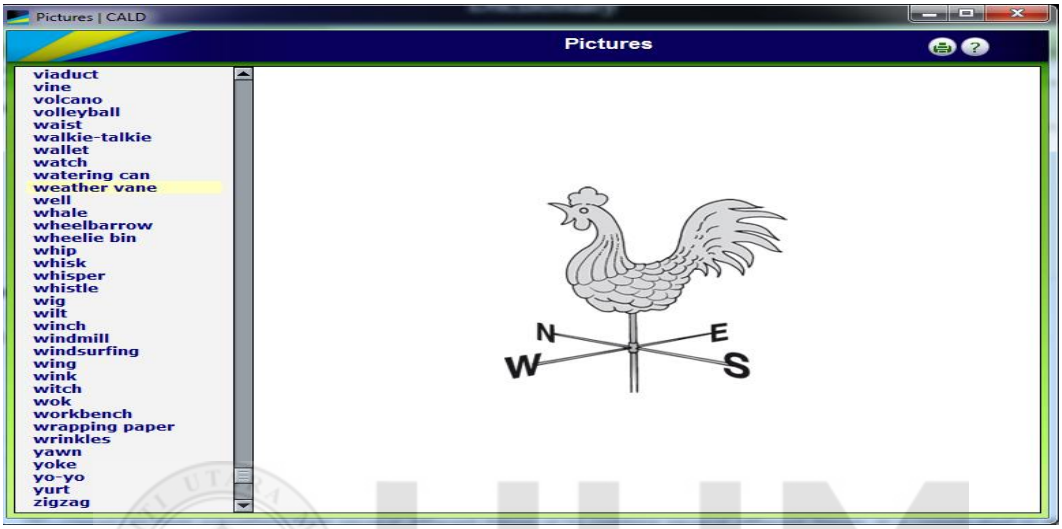


Figure 3.6. The Highlighted Word "weather vane" with Picture

Moreover, since the purpose of the current research was to find out the effects of computer on pronunciation skill, that is why, digital/electronic dictionary was selected instead of print/paper dictionary according to the nature of the current research. Likewise, the findings of (Metruk, 2017; Shen (2013) confirmed this notion that the use of electronic dictionaries for pronunciation teaching, is the preferred option for the nonnative learners of English language.

In this current experimental research, the researcher also found that the learners showed greater enthusiasm in the learning speech sounds while using CALD. They were very excited when they used to identify the symbols of different sounds in the dictionary, which they had learnt by phonetic videos. Learners were also provided a word list on

daily bases to do more practice on CALD, related to the particular sounds of the day. The particular sounds of the day were highlighted red to identify the target sounds. Some examples of additional word list of monophthongs, diphthongs and consonant sounds are given in the following:

Additional word list

Monophthongs with Examples

1	**/iː/**	Me, see, tea, read, leave, seal, sea, pea, breathe
2	**/i/**	In, sit, mill, fit, pin, bin, tin, chin, sin, dim, din

Diphthongs with Examples

1	**/ɪə/**	Ear, year, here, real, dear, deer, near, spear, sear, peer, clear, queer
2	**/ʊə/**	Hour, our, power, bower, flower, flour, cower, shower, tower, scour
3	**/eə/**	Hair, there, where, chair, hare, dare, flair, heir, pear, lair, fare, parent

Consonant sounds with Examples

1	**/p/**	Pop,pickle, penguin, pirate, parade, soapy, wrap, envelope
2	**/t/**	Two, teeth, tire, toast, tongue, rotten, potato, guitar, chocolate,
3	**/tʃ/**	Church, chew, chore, statue, temperature, couch, wrench

3.14.4 Rationale for Selecting Words Instead of Sounds

As Pakistani learners are unaware of 44 phonemic sounds. The knowledge of pronunciation of the selected sample of the respondents was very poor and limited to alphabetic knowledge only. There was no single subject who could identify the sounds and their symbols. Actually, in Pakistani schools, learners are taught alphabets only. They

(respondents) informed the researcher that it was the first time, they were told about 44 sounds. On the other hand, during the entire schooling, they were only taught the 26 English Alphabets. They never had idea to pronounce the words on sound pattern. That is why the researcher used words in the pretest instead of sounds to identify their proficiency level of pronunciation. Saito (2011) used pronunciation test in the same way. In his study, he used words in pronunciation test rather than symbols and the subjects were asked to read to identify eight segmental sounds.

3.14.5 The purpose of the Pronunciation Test

The pretest of pronunciation was used to find out the effectiveness of CALL program in developing awareness of the vowel and consonant sounds and to confirm the same proficiency level of both the groups as they got almost similar means scores in the pretest. Likewise, the same pronunciation test with alteration of some words was utilized to identify the effect of phonetic videos whether participants of Experimental Group 1 recognized the particular sounds and improved their pronunciation in the posttest.

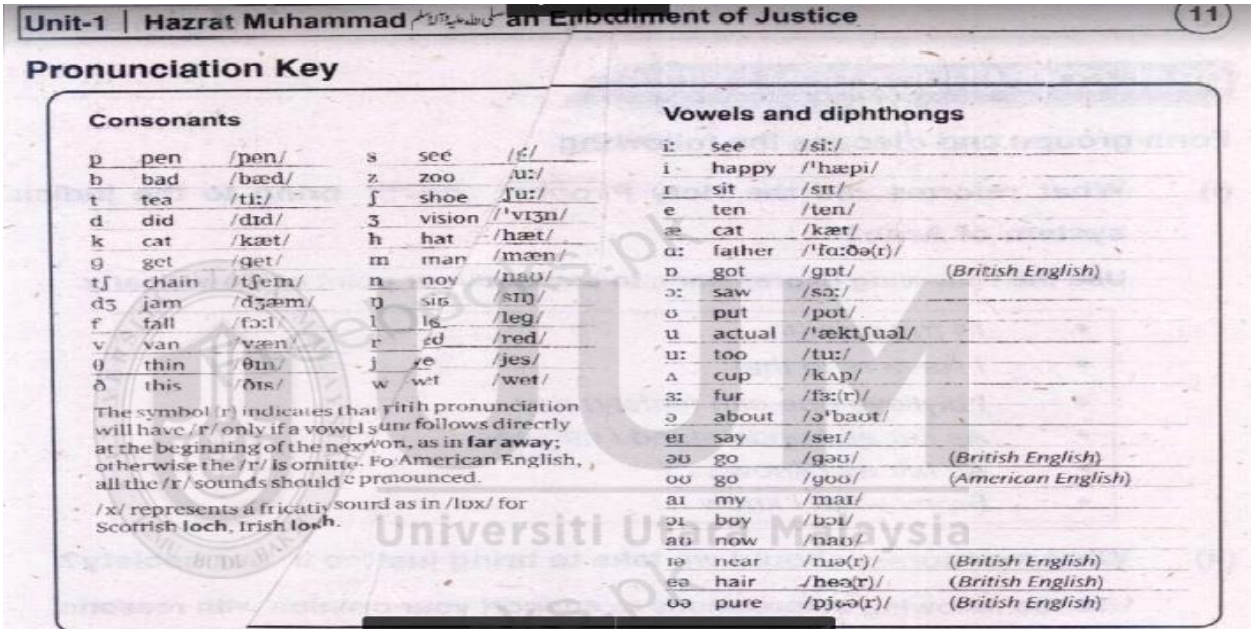
3.15 Underlying Principles of the Current Research Framework

Some basic principles were kept under consideration of the researcher while preparing the research framework:

3.15.1 Raising Awareness of Segmental Features of Pronunciation

The participants of the current research had not prior knowledge regarding the pronunciation sounds. During the experimentation, all subjects of Experimental Group 1

showed greater interest and they tried to imitate the native speakers in the language lab. According to the participants of Experimental Group 1, during this treatment, they also found out the IPA sounds (named as pronunciation key) which was given in the start of their English Text Book. However, before initiation of this program, they could not understand the pronunciation key and its usage in English language.



Unit-1 | Hazrat Muhammad ﷺ an Embodiment of Justice 11

Pronunciation Key

Consonants

p	pen	/pen/	s	see	/siː/
b	bad	/bæd/	z	zoo	/uː/
t	tea	/tiː/	ʃ	shoe	/ʃuː/
d	did	/dɪd/	ʒ	vision	/ˈvɪʒn/
k	cat	/kæt/	h	hat	/hæt/
g	get	/get/	m	man	/mæn/
tʃ	chain	/tʃeɪn/	n	noy	/naʊ/
dʒ	jam	/dʒæm/	ŋ	sin	/sɪŋ/
f	fall	/fɔːl/	l	leg	/leg/
v	van	/væn/	r	red	/red/
θ	thin	/θɪn/	j	yes	/jes/
ð	this	/ðɪs/	w	wet	/wet/

The symbol /r/ indicates that British pronunciation will have /r/ only if a vowel sound follows directly at the beginning of the next word, as in **far away**; otherwise the /r/ is omitted. For American English, all the /r/ sounds should be pronounced.

/x/ represents a fricative sound as in /lɒx/ for Scottish **loch**, Irish **lo**ch.

Vowels and diphthongs

iː	see	/siː/	
i	happy	/ˈhæpi/	
ɪ	sit	/sɪt/	
e	ten	/ten/	
æ	cat	/kæt/	
ɑː	father	/ˈfɑːðə(r)/	
ɒ	got	/gɒt/	(British English)
ɔː	saw	/sɔː/	
ʊ	put	/pʊt/	
u	actual	/ˈæktʃuəl/	
uː	too	/tuː/	
ʌ	cup	/kʌp/	
ɜː	fur	/fɜː(r)/	
ə	about	/əˈbaʊt/	
eɪ	say	/seɪ/	
əʊ	go	/gəʊ/	(British English)
oʊ	go	/goʊ/	(American English)
aɪ	my	/maɪ/	
ɔɪ	boy	/bɔɪ/	
aʊ	now	/naʊ/	
ɪə	near	/nɪə(r)/	(British English)
eə	hair	/heə(r)/	(British English)
ʊə	pure	/pjʊə(r)/	(British English)

Figure 3.7 Screenshot of Pronunciation Key Given in English Text Book (Kiyani, 2018, p.11).

3.15.2 Developing Interest among the Subjects of the Study

Learners of Experimental Group 1 showed greater interest and enthusiasm to learn phonemic sounds as compared to Experimental Group 2. They wanted to watch the videos again and again, even, when the treatment time was over, they sometimes requested next teacher to give them some extra time to do more practice of IPA sounds through listening the videos.

3.15.3 Phonological Instruction with the Help of Phonetic Videos (Controlled Activity)

The participants of Experimental Group 1 were shown videos and they were instructed how to pronounce the phonemic sounds. They also learnt difference between short and long vowel sounds and voiced and unvoiced consonants. This activity was given the name of "controlled activity" by Celce-Murcia et al. (2006). At the end of the treatment, all the participants (Experimental Group 1) were post tested.

3.15.4 Pronunciation Practice with CALD (Guided Activity)

In this research, the learners of Experimental Group 1 performed repeated practice of the sounds with the assistance of CALD (Celce-Murcia et al., 2006). The respondents of Experimental Group 1 used this dictionary to observe the native sounds as well as symbols of each sounds in different words. An additional word list was also provided to the learners to do more practice of the sounds apart from the examples which were given by the speakers of the selected videos.

3.16 Rationale for Selecting Particular Phonetic Videos and CALD

The researcher selected these digital videos because language of all these phonetic videos was very simple and clear. Particularly, the woman in videos No 1, 2 and 3. She explained all phonemic sounds while performing certain actions. Examples used by both the speakers were according to the level and context of the learners. Pennington (1999)

and Bott (2005) also proposed that there must be inclusion of more than one voice in a native speech model. Thus, the learners used two different types of two speech models. Then, there was a feature of cost effective as all videos were downloaded from internet freely available. CALD was CD-ROM software which was bought once and installed in all other computers in laboratory.

Some software are available online to teach pronunciation but they are very costly and it becomes very difficult for a researcher to buy such software. If one uses some other software which are fee they are only trial versions and expire before completing the actual treatment. Carrying out the current study, the researcher tried a lot to find out such software which could fulfill the purpose of this research. After the search of several months, the researcher was able to find out these phonetic videos as these videos comprised all 44 IPA sounds. After, finding these videos and making mind to use these videos for the current study. Meanwhile, the researcher encountered two software *MyET* and *Pronunciation Coach. MyET* software was selected for the pretest and posttest scoring instead of pronunciation test 9-pointLikert scale. However, after installation of the trial version, it was realized by the researcher that this software was suitable for suprasegmental features as it focused on pronunciation in terms of pitch, timing and emphasize and it was all about stress. Another reason was rejecting this software, in this program was that very complicated sentences were employed in the said software and it was the participants' level of English proficiency. Online registration was another issue not selecting it for the current research because of unavailability of internet in government school especially in rural areas. There was another option which was considered called *"Pronunciation Coach"*: but this software measured wrong scoring, its

digital scoring was unreliable. In pilot study, participants spoke wrong words; the software gave highest score for their wrong pronunciation as above 90 out of 100.

Furthermore, initially some phonetic videos were utilized to teach the sounds, downloaded from www.turtle.diary.com. The duration of each video was consisting of 2-3 minutes. Although, one can find a lot of instructional material regarding improving English language material such as very initial level alphabets, grammatical rules, synonyms, antonyms, articles and capitalization, animated pictures, lip movement with highlighted letters, learning games and much more. Nonetheless, all that material was suitable for early stages of second language learning and the participants of this research were secondary school learners, they already knew all alphabets in their first grade, grammatical rules throughout their schooling. These were helpful for learning of letters instead of phonemic sounds. So, this material was also rejected as the purpose was to teach the learners 44 IPA sounds not above-mentioned activities.

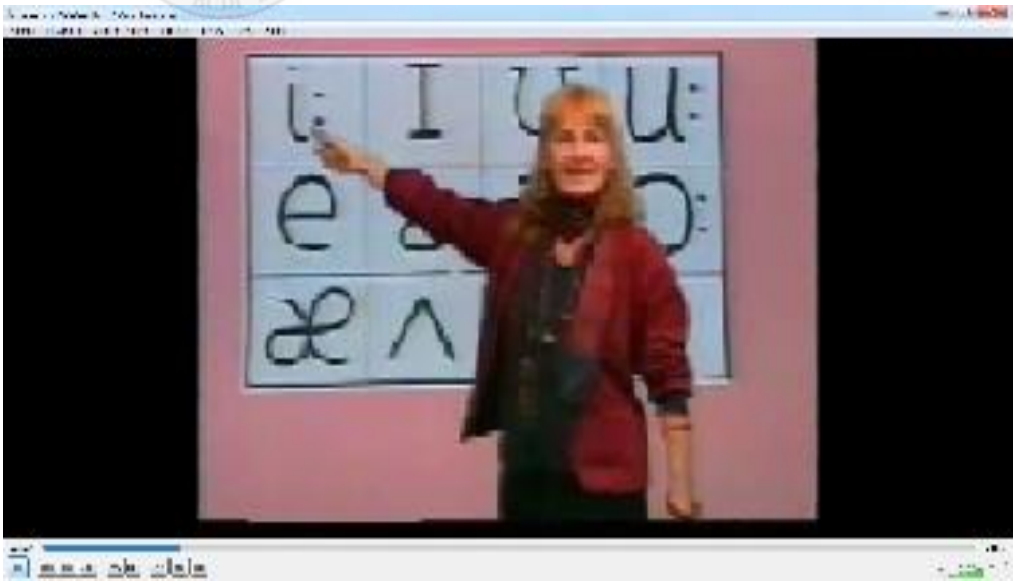


Figure 3.8. Screenshot of Phonetic Video No 1

Source

https://video.search.yahoo.com/search/video?fr=mcafee&p=IPA+sounds+videos#id=3&vid

Figure 3.9. Screenshot of Phonetic Videos No 2

https://video.search.yahoo.com/search/video?fr=mcafee&p=IPA+sounds+videos#

Figure 3.10. Screenshot of phonetic videos No 3

https://video.search.yahoo.com/search/video?fr=mcafee&p=IPA+sounds+videos#

Figure 3.11. Screenshot of phonetic videos No 4

Source:

https://video.search.yahoo.com/search/video?fr=mcafee&p=IPA+sounds+videos#

Figure 3.12. Screenshot of phonetic video No 5

Source:

https://video.search.yahoo.com/search/video?fr=mcafee&p=IPA+sounds+videos#

All above-shown phonetic videos were included in the treatment plan. The subjects of Experimental Group 1 liked the idea of learning phonemic sounds through these videos. They all participated with full enthusiasm.

3.17 Procedure of the Pretest and Posttest

The pretest procedure for the participants of both the groups was performed in the same room. High section classrooms were situated on first floor of the school building and they were located the remote corner of the school building that is why the whole procedure was performed in a peaceful environment, far from the noise of junior classes. The environment of the classrooms was very calm and peaceful during the pretest. After formation of the two groups, Experimental Group 1 was pretested first. All the

participants were invited one by one to test their segmental knowledge. Although, there was no partition of the room, however, the participants, who were waiting for their turn, were seated in the far corner of the classroom to avoid distractions.

Similarly, the posttest was also conducted in the same pattern. Some sort of noise was observed by the researcher during the posttest procedure; however, the participants were reminded constantly to be patient and remained silent during the post testing. The respective school teachers cooperated a lot to maintain the discipline in the classroom. Additionally, researcher hired an IT expert to manage all the data collection procedure. She assisted the researcher to record the voices of the participants in the pretest and posttest and in the categorization of the data. Besides, she performed installation procedure of phonetic videos and CALD, managing other instrumentation such as attaching the cables to the PCs and setting the headphones were also performed by her.

First two complete sessions were invested in the introduction, purpose of the full research program, developing rapport between the participants and the researcher. An introductory lecture about pronunciation was delivered to both the groups with the help of a flow chart (Appendix E). Five phonetic videos (comprising all 44 IPA phonemic sounds) and CALD were utilized to investigate the effects of computer on learning of 44 IPA phonemic sounds. Experimental Group 1was shown phonetic videos to teach 2-3 sounds in every session. Monophthongs, diphthongs, short and long vowel, consonants, voiced and unvoiced all sounds were taught. Additionally, CALD was used for 15 minutes at the end of every session to do more practice of related sounds of the same day.

Overall, 46 hours treatment was given to both the groups, 23 hours per each group. Experimental Group 2 was given treatment of the same material traditionally by oral instructions with the help of the white board, board marker without computer. The both groups were taught by the researcher. Jenkins (2004) expressed that the use of computer-assisted pronunciation supplied learners with personal and stress-free exposure through which they get unlimited input and perform according to their own potential, speed and get prompt feedback.

3.17.1 Transcription of the Audio Recordings

After recording the pretest all the audio recordings were converted into wave files through Free Studio File Converter to run through foot pedal machine. For example, audio recordings of the participants from 30 to 35 were transferred (Figure 4.1) in the Free Studio File Converter.

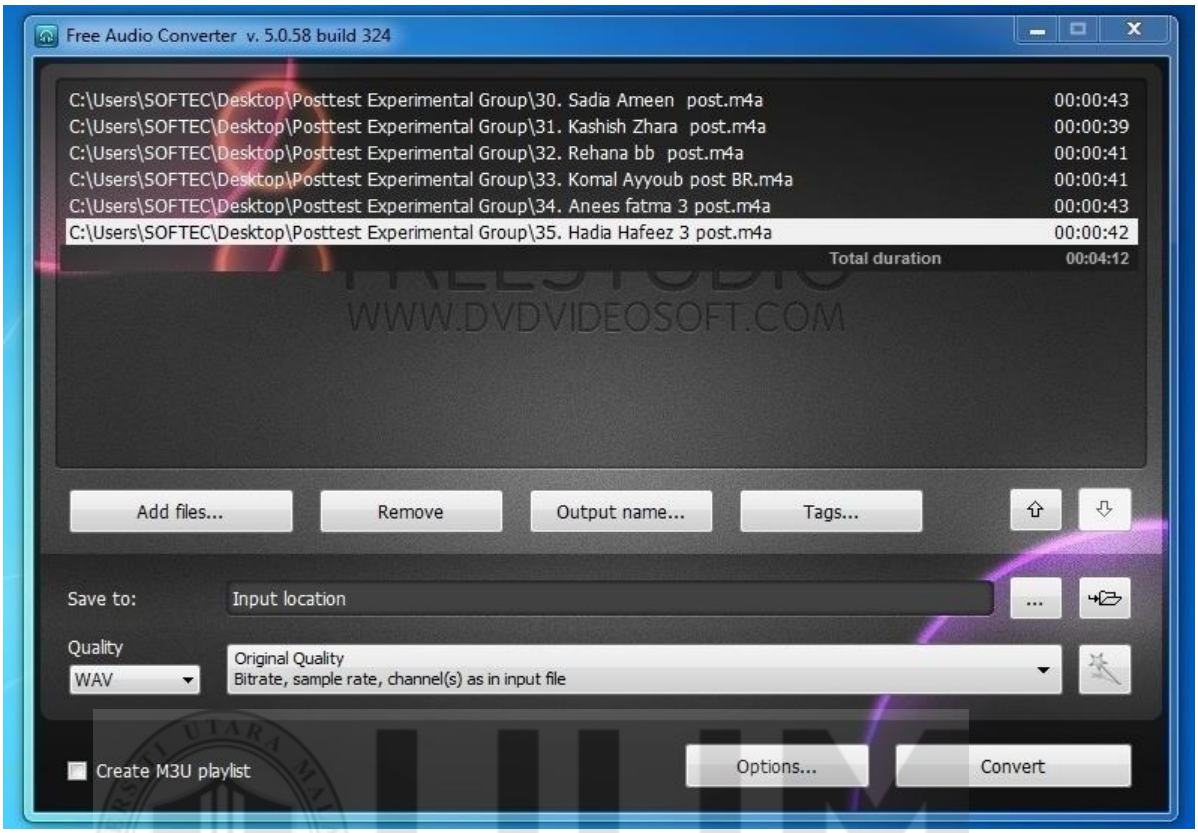


Figure 3.13 Screenshot of Free Studio Converter (the image was taken from the installed software).

Then by clicking on 'convert', all these recordings were converted into wave files ready to run on foot pedal machine through laptop. Figure 3.13 shows the images of the converted wave files in Free Audio File Converter. All the data obtained through the pretest and posttest was transcribed according to the same pattern.

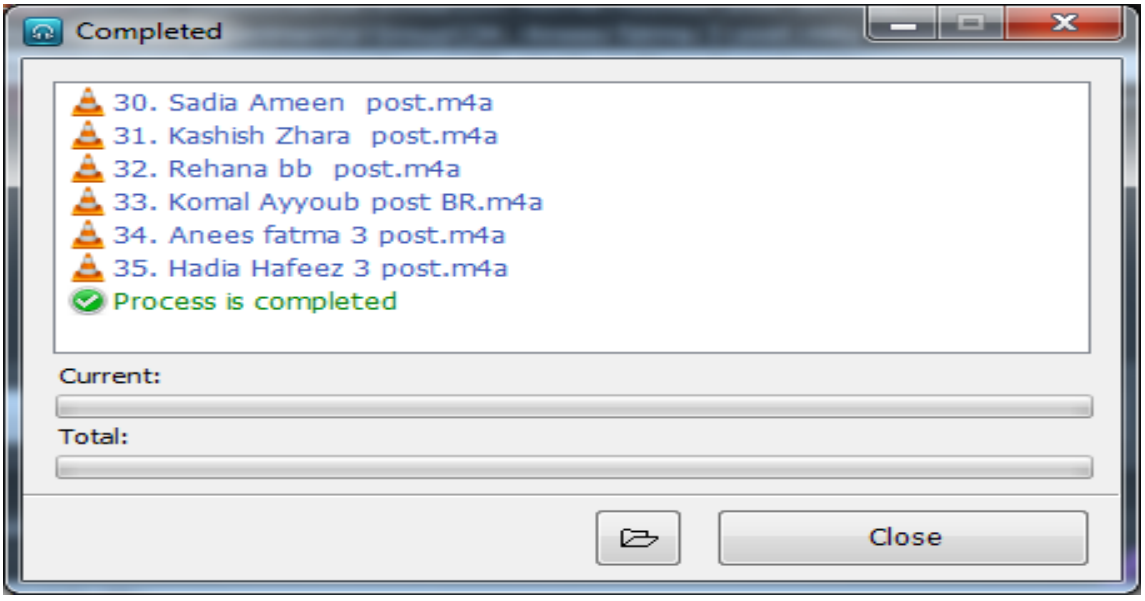


Figure 3.14 Converted Audio Recording into Wave Files (image was taken from the installed software).

All the learners were awarded tick-based grades on 9-point Likert-scale manually by the human raters. Scores of all the participants gotten in the pretest and posttest were added individually and then tabulated in SPSS for every construct (phonemic sounds) and the task was done by the researcher manually. It took hours to complete the whole procedure. All the obtained scores were measured on Likert scale the they were added under the particular sub categories such as scores in monophthongs, scores in diphthongs and scores in consonants differently. The 9-points of Likert scale was attributed with the features which are as under:

Extremely Incorrect= EI	1
Very Incorrect=VI	2
Moderately Incorrect=MI	3
Slightly Incorrect=SI	4
Neither Incorrect nor Correct=NINC	5

Slightly Correct=SC	6
Moderately Correct=MC	7
Very Correct=VC	8
Extremely Correct=EC	9

Both the raters were given a foot pedal machine and head phones and by applying these equipment, the task of scoring became rather easier. For instance, to play and listen the audio recording, stop the recording if the voice was not very clear, and it could be rewarded it just by pressing the right side of the pedal machine without any difficulty, listen the sound again and then go forward.

Figure 3.15. Foot Pedal Machine (http://www.altoedge.com/pedals/index.html)

Figure 3.16. Headset

Source:

https://images.search.yahoo.com/search/images?p=images+of+headphones&fr=mcafee&imgurl

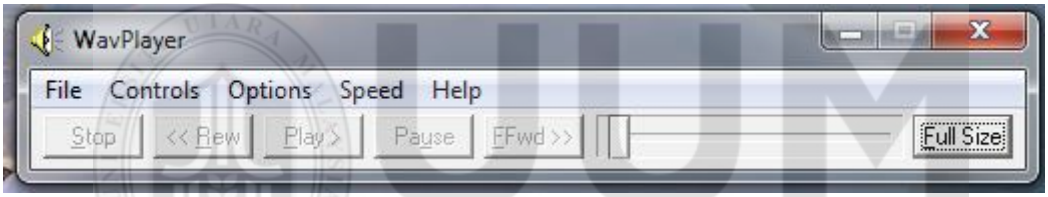


*Figure 3.17*An Image of Wave File Running in Wave Player (image was taken from the installed software)

3.18 Treatment

All the above-mentioned material was downloaded from internet before initiation of the actual research to make the current research program more and more applicable to avoid any inconvenience. Next step was the selection of the school and get permission from the authorities of the school and to visit the computer lab to check whether all the systems were in working position.

3.19 Actual Research Plan

Daily Activities related to Phonetic Videos

1st day (21st December 2016)

Phonetic video No 1 & No 4 (Introduction)

2nd day (22nd December)

Learners were asked to listen the 1st video again and again

3rd day (23rd December)

Vowel sounds (monophthongs)

/i:/& /i/

4th day (2nd January 2017)

Vowel sounds

/ʊ/ & /u:/

5th day (3rd January)

Vowel sounds

/e/ & /ə/

6th day (4th January)

Vowel sounds

/ɜ:/& /ɔ:/

Daily Activities related to CALD

1st day (21st December 2016)

Introduction of the dictionary and its usage

2nd day (22nd December)

Learners did practice how to use the dictionary

3rd day (23rd December)

Words for practice on CALD

/i:/Me, see, tea, read, leave, seal, sea, pea, breathe

/i:/In, sit, mill, fit, pin, bin, tin, chin, sin, dim, din

4th day (2nd January 2017): Look, book, took, shook, full, brook, cook, crook

Shoe, tool, rule, pool, too, snooze, blue, drew

5th day (3rd January): Ten, pen, bed, head, red, men, hen, led, bled, dead

Uh, teacher, feature, pitcher, creature, preacher

6th day (4th January): Turn, burn, curd, herd, gird, third, word, spurred

Saw, jaw, raw, flaw, poor, door, paw,

7th day (5th January)

Vowel sounds

/ʌ/ & /æ/

8th day (6th January)

Vowel sounds

/ɑ:/& /ɒ/

9th day (7th January)

All monophthongswere revised orally with the help of phonemic chart

10th day (9th January)

Phonetic Video No 2 & Phonetic Video No 5 (Introduction to diphthongs)

(ɪə) & (ʊə)

11th day 10th January

Diphthongs sounds

/eə/ & /eɪ/

12th day (11th January)

Diphthong sound

/ɔɪ/ &/ɒɪ/

7th day (5th January)

Up, cup, cut, come, jug, hut, shut, mug, nut, bug

Hat, pan, bat, man, bag, cat, hand, pan, can, rat

8th day (6th January)

Arm, charm, farm, alarm, scarm, far, aunt, heart

On, rock, dog, body, cough, box, fox, mop, sock

9th day (7th January)

Revision of all monophthongs

10th day (9th January)

Ear, year, here, real, dear, deer, near, spear, sear, peer, clear, queer

Hour, our, power, bower, flower, flour, cower, shower, tower, scour

11th day 10th January

Hair, there, where, chair, hare, dare, flair, heir, pear, lair, fare, parent

Pay, they, say, play, lay, ray, bay, may, tray, make, way, hey, neigh

12th day (11th January)

Noise, point, boy, oil, joy, toy, destroy, toil, royal, spoil, boil, soil

Eye, by, time, climb, chime, rhyme, lime,

13th day (12th January)

Diphthong sounds

/əʊ/ & /aʊ/

14th day (13th January)

All diphthongs were revised

Orally

15th day (17th January)

Phonetic Video 3

(Introduction)

Consonant sounds

/p/ & (t)

16th day (18th January)

(tʃ), /k/ & /f/

17th day (19th January)

/ɸ/ &/s/

13th day (12th January)

Nose, go, know, no, snow, fellow, throw, foe, low, follow, row

Ow, out, bout, doubt, stout, how, cow, down, gown, frown, brown

14th day (13th January)

Revision of all diphthongs by using phonetic videos and CALD

15th day (17th January)

Pop,pickle, penguin, pirate, parade, soapy, wrap, envelope

Two, teeth, tire, toast, tongue, rotten, potato, guitar, chocolate

16th day (18th January)

Church, chew, chore, statue, temperature, couch, wrench

Cake, coin, candy, cave, pumpkin, vacuum, snack, snake

Fan, phone, finger, feather, fence, laughing, buffalo, dolphin

17th day (19th January)

Three, thorn, thunder, thermometer,

18th day (20th January)

/ʃ/, /b/ & /d/

19th day (21st January)

/dʒ/, /g/ & /v/

20th day (23rd January)

/ð/, /z/ &/ʒ/

21st day (24th January)

/m/, /n/ & /ŋ/

22nd day (25th January)

h/, /l/ &/r/

23rd day (26th January)

/w/ &/j/

18th day (20th January)

Shoe, shape, ship, chef, shut, shy, shadow, cushion, punish

Bus, bug, bee, birthday, bottle, butter, marbles, robin, rib, sob

Dog, dad, dark, dot, dive, ladder, idea, calendar, grade, mad

19th day (21st January)

Jam, germs, jaw, jeans, job, joke, juice, agent, bridge, pigeon

Good, goose, gate, gulp, ghost, garage, alligator, yoga, pigtail

Very, valley, vowels, visit, olive, diver, vase, travel, heavy

20th day (23rd January)

The, than, weather, leather, worthy, clothe, rather, father, bath

Zoo, zinc, zero, zip, zone, busy, closet, closet, scissors, laser

Pleasure, division, usually, television, version, conclusion

21st day (24th January)

Man, match, mice, mail, mask, mess, human, family, comb

Nine, knees, necklace, knife, nail, rainbow, dinosaur, brain

Wings, sings, stings, strings, swings, bring, kings, spring, ring

22nd day (25th January)

Happy, hall, health, heart, height, whole, forehead, playhouse

Like, leaf, lamp, laugh, letter, alarm, lock, pillow, muscle

Red, run, rice, wrist, doctor, tire, corn, syrup, nurse, iron

23rd day (26th January)

Wind, warm, web, wild, wonderful, wallet, wagon, wisdom

Yes, yard, yawn, yell, yet, you, young, youth, unique, Europe

All these activities were taught to the participants of Experimental Group 1 however, Experimental Group 2 was taught phonemic sounds without CALL. Experimental Group 1 was given treatment by showing phonetic videos and through usage of CALD. The duration of the treatment was 46 hours 23 hours per each group. All the participants were given grades according to the performance in the pretest and the posttest. Their performance was analyzed on 1-9-Likert scale. All gotten grades were combined manually by the researcher and a complete award list was prepared for each group. Finally, the data obtained by all participants of both the groups in the pretest and posttest tabulated using t-test SPSS (version 23) for obtaining the means of the results. Apart from this, inter group comparison and intra group comparison were also performed to confirm or reject the hypotheses.

3.20 Summary

The approach used in the current study was an experimental research design under the umbrella of quantitative research paradigm. All the key features of true experimental research were employed in the current research. Keeping in view, the research paradigm, formation of two groups, i.e., Experimental Group 1 and Experimental Group 2, randomization of the participants, the pretest, the treatment and posttest all were elaborated in detail. Apart from this, justification of all the main features of the research such as selection of the school, participants, treatment plan, sample size along with the sampling procedure. Independent variables such as phonetic videos and CALD as well as dependent variables as pronunciation all are discussed with a greater detail and actual research plan was also explained. Subsequently, the detailed explanation of the

instrumentations and data collection techniques with enough detail are also described in this chapter. Furthermore, reliability and validity of the instrumentations are described in this chapter.

CHAPTER FOUR

RESULTS AND FINDINGS

4.1 Introduction

This chapter consists of quantitative data analysis of the experimental group 1 and group 2 in details. An experimental research was employed to collect the quantitative data to prove the said hypotheses and the data was analyzed through t-test in SPSS software (version 23). Data was evaluated using 1-9-point Likert scale to verify the hypotheses of the current research whether the learners improved their phonemic sounds after receiving innovative computer-augmented treatment, i.e. the use of phonetic videos and digital dictionary benefited them.

The purpose of this study was to find out the effect of CALL on pronunciation learning and segmental features of pronunciation such as single vowel sounds, double vowel sounds (diphthong), consonants sounds, voiced and unvoiced sounds. These sounds were taught to the learners by employing phonetic videos and digital dictionary CALD to examine the effect of computer assisted language learning (CALL) on pronunciation at secondary school level in Pakistan. The learners were divided into two groups by random sampling. One group was taken to the lab to teach pronunciation through computer by using phonetic videos and digital dictionary while the second group was given treatment by teacher without CALL.

Both the groups, i.e., Experimental Group 1 and Experimental Group 2 were taught an identical content material of 44 IPA sounds by the researcher herself. Experimental

Group 1 was given treatment by showing phonetic videos and utilizing digital dictionary as well. Whereas, Experimental Group 2 was taught IPA sounds without CALL by lecture method as learners are accustomed in Pakistani context, to learn English language by a teacher via oral instructions, with the help of white board and board marker. Therefore, it was anticipated that investigating the effect of computer assisted language learning (CALL) on pronunciation of ELL at secondary school level would be a worthwhile study.

4.2 Statistical Data Analysis

The collected data was analyzed on SPSS (version 23) by employing t-test data analysis technique. To see the means difference, the results of both the pretest and posttest of both the groups were compared. Inter group and intragroup comparison was also performed to analyze the data to get more accurate findings and vivid results from the collected data of the current research.

4.2.1 Research Hypothesis No 1

The purpose of the first research question and hypothesis was to evaluate the effects of computer on pronunciation skill. All the pretest scores of both the groups were evaluated on 1-9 Likert scale and then they were tabulated on independent sample t-test in SPSS to compare the mean scores of both the groups.

H1 The secondary school English language learners who are taught through CALL are better in pronunciation than the learners who are taught without CALL in Pakistan.

When two experimental groups are taken to examine the effect of independent variable on dependent variable then a pretest is taken before the initiation of treatment. For this purpose, mean of both the pretests of both the groups must be identical or there must not be statistically difference in the mean scores of both the groups. Apart from this, after treatment, if there is any change or improvement, it could be claimed that the improvement is the result of innovative treatment rather being any other factor involved. The t-test was employed to identify the difference between the means showing that the results were significantly at the $p < .05$ level. The statistical detail of the pretests of both of the groups is given in Table 4.1 and Table 4.2.

Table 4.1

Group Statistics of the Pretests of Group 1 and Group 2 for Pronunciation

Groups	***N***	***M***	***S D***	***S E M***
Pre Test Group 1	35	122.2857	12.37543	2.09183
Pre Test Group 2	35	114.6571	12.31915	2.08232

Table 4.2

Independent Samples t-test of the Pretests of Group 1 and Group 2 for Pronunciation

	Levene's Test for Equality of Variances		**t-test for Equality of Means**						
								95% C I	
	F	*Sig.*	*t*	*df*	*Sig. (2-tailed)*	*M D*	*S E D*	*LL*	*UL*
Equal variances assumed	.064	.801	2.585	68	.012	7.62857	2.95157	1.73880	13.51835
Equal variances not assumed			2.585	67.999	.012	7.62857	2.95157	1.73880	13.51835

Table 4.1 shows that the number of respondents in both the groups were 35 (N_{E1} =35; N_{E2} =35) is equal as both the groups had 35 participants. It means that sample size (N) is 35 in each group. Experimental group 1 got mean = 122.28 (X_{ex1}=122.28): while Experimental Group 2 mean = 114.65 (X_{ex2}=114.65) suggesting that both the groups have approximately an equal level of homogeneity in the pretest. The standard deviation is (12.37) for Experimental Group 1 and (12.31) for Experimental Group 2 suggesting no significant difference between the two groups almost the same value for standard deviation is appeared in the pretest.

Table 4.2 indicates the Levene's test findings of t-test for the equality of variance that suggests homogeneity of variance. In Levene's test, it is assumed that the standard deviation must show the same variance in (pretest) samples of both the groups. Although, the variance must not be exactly the same, however, these findings should be similar at least to the extent that one cannot see the statistically significance there. In Levene's test F-value is equal to (.064) which is higher than the p-value (0.05). F-value exhibits that there is standard deviations are not same, in all prospects. Furthermore, these findings such as t-value and p-value have greater importance and consideration regarding the homogeneity of variance assumption of both the groups. P-value must be equal to ($p<.05$) or less than ($p<.05$) in Levene's test for equality of variance test.

In the current research, Table 4.2 reveals that the p value is (.012) which is higher than ($p < .05$), indicating that the results are not numerically different as both the groups have similar significance values which are not statistically considerable. T-test also assumes that the variance expresses as a standard deviation are the same in both the samples and

they do not have to be exactly the same but they have to be the same to the extent that they are not statistically different from each other. Here in Table 4.2 t value is (2.58) with the degree of freedom (68). The most significant value in the table is P value with (.214) which is more than (0.05), suggesting that there is no significant difference between the mean scores of Experimental Group 1 and Experimental Group 2. The means of Experimental Group 1 and Experimental Group 2 are (122 and 114) respectively. The mean difference is (.7.62) with standard error of (2.95). However, the confidence intervals of the difference between means of both the groups are (1.73-13.51) and this difference is not statistically significant.

Table 4.3

Group Statistics of the Posttest of Group 1 and Group 2 for Pronunciation

Groups	***N***	***M***	***S D***	***S E M***
Pre Test Group 1	35	347.1143	47.77568	5.80753
Pre Test Group 2	35	134.3714	39.78774	3.37364

Table 4.4

Independent Samples t-test of the Posttest of Group 1 and Group 2 for Pronunciation

	Levene's Test for Equality of Variances		**t-test for Equality of Means**						
								95% C I	
	F	*Sig.*	*t*	*df*	*Sig. (2-tailed)*	*M D*	*S E D*	*LL*	*UL*
Equal variances assumed	2.18	0.03	20.243	68	.000	212.74286	10.50929	91.77190	233.71382
Equal variances not assumed			20.243	65.844	.000	212.74286	10.50929	91.75946	233.72625

On the bases of above-mentioned discussion, it could be said that there was no difference between the means of both the groups. On the other hand, Table 4.3 exhibits that in the posttests there were 35 participants in each group. The mean results indicated as (347.11 and 134.37) for the experimental group 1 and 2 respectively that is numerically and statistically significant findings to show the difference in the mean of both the groups. While standard deviation is (47.77) for Experimental Group 1 and (39.78) for Experimental Group 2. These two differences in mean and standard deviation reveal that there was a significant difference in the posttest results as compared to the pretest findings.

In Table 4.4, there is independent samples t-test and Levene's Test for "equality of variances assumed for both the experimental groups. According to the statistical criteria, mean and standard deviation in both the groups must not be similar. Table 4.4 shows that F-value is (2.18) which is higher than its significant value of (0.03) suggesting statistically significant findings as it is also less than p-value (0.05). That is why, it could be inferred that assumed homogeneity of variances is not having the same findings. Similarly, t-value is (20.24) with the degree of freedom (68) along with significant level of (0.000) and it is also less than P-value of (0.05). Apart from this, Table 4.4 also indicates that the difference in means is (212.74) and standard error is equal to (10.50) and it is estimated the deviation of the average sample difference. As far as the confidence interval is concerned of Experimental Group 1 and Experimental Group 2 that is (99-233), which means that both the groups have significant difference in findings. Thus, t-value, degree of freedom, two-tailed significance, mean difference, standard error

difference and the confidence level of the both the samples are same assuming the equal variances of the results.

Therefore, all the mentioned-above findings of Levene's test for equality of variances and t-test for equality of means suggest that the hypothesis No 1 has been supported having the significant differences in the mean results of group 1 and group 2 in the posttests. It also suggests that there is a significant effect of computer (phonetic videos/digital dictionary) on pronunciation of Experimental Group 1 as compared to Experimental Group 2, which showed less improvement in learning of phonemic sounds through traditional method.

The means and the standard deviations for both the groups in the posttests highlighted that the performance of the Experimental Group 1 was significantly better in the mean results as compared to Experimental Group 2. On the bases of the above-mentioned statistics, this difference could be said due to the innovative treatment which was provided to Experimental Group 1 as statistics suggest that the learners of Experimental Group 1 showed more interest and better performance in learning phonemic sounds through phonetic videos and by using digital dictionary as compared to Experimental Group 2 which was taught traditionally.

4.2.1.1 Intra Group Descriptive Statistics for Experimental Group 1

Table 4.5 shows the results of paired sample statistics of the pretest and posttest of Experimental Group 1 for pronunciation. The mean of both the samples showed as (122.2857) for the pretest and (296.3714) for the posttest with a greater difference of

(174.08). Both the tests have same sample size of 35 in each. There is a significant difference between the mean of both the samples as (12.37) for pretest which is too far from the posttest mean value of (42.16). The standard error shows the findings of (6.09 and 2.30) to indicate how far a sample from the actual population is.

Table 4.6 paired samples suggest that there is no correlation between both the findings of the pretest and posttest results. Correlation of both the samples exhibited as (-.048) indicating that there is a negative correlation between two tests of Experimental Group 1. This negativity of the correlation in both the tests increased the standard error mean which is (7.52). Table 4.7 presents that the paired sample test of the pretest and posttest of Experimental Group 1 gives more detail of some other different various findings.

Table 4.5

Paired Samples Statistics of the Pretest and the Posttest of Group 1 for Pronunciation

		M	***N***	***S D***	***S E M***
Pair 1	Pretest Group 1	122.2857	35	12.37543	6.07953
	Posttest Group1	296.3714	35	42.16570	2.30003

Table 4.6

Paired Samples Correlations of the Pretest and the Posttest of Group 1 for Pronunciation

		N	***C***	***Sig.***
Pair 1	Pretest and Posttest of Group 1	35	-.048	.785

Table 4.7

Paired Samples Test of the Pretest and the Posttest of Group 1 for Pronunciation

		Paired Differences							
					95% C I				
		M	***S D***	***S E M***	*LL*	*UL*	**t**	**df**	**Sig. (2-tailed)**
Pair 1	Pretest and Posttest of Group 1	174.08571	44.50933	7.52345	189.37520	158.79622	-23.139	34	.000

The findings of the pretest and posttest mean scores also suggest that considerable amount of mean difference (M=174.08) is seen in the intra group statistics. T value (t=-23.139) is also suggesting numerically significant improvements in mean scores of the posttest as well (.05>.000) interpreting that the computer-aided treatment was effective regarding the teaching of 44 phonemic sounds of English pronunciation.

Since, the significant difference in the means is determined by t value of the posttest results, which is remarkably different in the posttest results too. The t-observed value was (-23.139) (t_{obs}=-23.139) along with the degree of freedom 34 (df=34) which are higher score than the critical value of *t* which is (.000.) Therefore, the higher means of t value was interpreted as that the study proved significant difference regarding the means of the posttest results as compared to the pretest mean scores.

The descriptive statistics t-test of the posttest shows the results as discussed in the following. According to the rule of t-test if the P value is (0.05) or less than (0.05) then there is a significant difference in mean results. Table 4.7 also exhibits that P value is (.000) which is less than (0.05), resulting in the significant level of mean results of both the pretest and posttest. The findings also suggest that Experimental Group 1 outperformed in the posttest regarding pronunciation of phonemic sounds. Therefore, taking into account all the similarity of the findings of Experimental Group 2 in both the pre and posttest and the discrepancy of the statistical values in the pre and posttest of Experimental Group 1, the **hypothesis No 1** is confirmed here as "The secondary school English language learners who are taught through CALL are better in pronunciation than the learners who are taught through the traditional methods in Pakistan". Apart from the confirming the hypothesis No 1 these findings answer the question No 1

Is there significant difference between the effects of CALL and teaching pronunciation without CALL on English language learners' pronunciation in secondary school in Pakistan?

Surely, on the bases of above mentioned findings, there is a significant difference between the learners who got CALL treatment and the learners who were taught pronunciation without CALL.

4.2.2.2 Intragroup Statistics of Experimental Group 2

The Intragroup statistics differences of Experimental Group 2 indicate that the total mean scores of the pretest tabulated as (114.65) whereas the total mean score of the posttest is (119.54) in Table 4.8 have small difference. Experimental Group 2 has standard deviation of (12.31915) and in the posttest it increased to (12.77) suggesting slightly better improvement in 44 phonemic sounds after attending 23 sessions of pronunciation instructions. However, these small differences in results could not be said statistically significant findings

Table 4.8

Paired Samples Statistics of the Pretest and the Posttest of Group 2 for Pronunciation

		M	N	S D	S E M
Pair 1	Pretest Group 2	114.6571	35	12.31915	6.07953
	Posttest Group2	119.5429	35	12.77715	2.30003

Table 4.9

Paired Samples Correlations of the Pretest and the Posttest of Group 2 for Pronunciation

		N	C	Sig.
Pair 1	Pretest and Posttest of Group 2	35	.279	.785

Table 4.10

Paired Samples Test of the Pretest and the Posttest of Group 2 for Pronunciation

		Paired Differences							
					95% C I				
		M	S D	S E M	LL	UL	t	df	Sig. (2-tailed)
Pair 1	Pretest and Posttest of Group 1	-4.88571	15.07388	2.54795	-10.06377	.29234	-1.918	34	.064

Table 4.9 tells that both the tests have same size of participants 35 in each in the pretest and posttest. The paired sample correlation indicates that there is a positive relationship between two tests means the difference in results is not statistically significant.

Table 4.10 presents the most significant values of the pretest and posttest of Experimental Group 2. First, there is a mean difference as (-4.88) is very small indicating that there is no difference in both the tests of Experimental Group 2. The standard error mean is (2.54) that is also too small. Next, there is a level of confidence from (-10.06) as lower level and is (.2923) as upper level. The t value is very small as (-1.91) and the most important of all these findings is p-value which is interpreted as (.064.) Since sig (2-tailed) is more than (.05) suggesting that the there is no significant difference in the pre and posttest mean scores of Experimental Group 2. This also suggests that the traditional instructions for 44 phonemic sounds were not very effective.

Therefore, taking into account all the discrepancy of the statistical values in the pre and posttest of Experimental Group 1 and similarity of the findings of the Experimental Group 2 in both the pre and posttest, the **hypothesis No 1** is again confirmed that learners who were taught through CALL had better pronunciation level than the learners who were instructed pronunciation without CALL.

4.2.2 Research Hypothesis No 2

The second objective of the current study was to examine the effectiveness of CALL and traditional method regarding learning of vowel sounds on pronunciation skill at secondary school level in Pakistan.

H2. The secondary school English language learners who are taught through CALL are better in pronunciation of vowels sounds than the learners who are taught pronunciation without CALL in Pakistan.

All the findings of Experimental Group 1 and Experimental Group 2 were analyzed using SPSS. Intergroup comparisons were carried out to evaluate the effectiveness of CALL and traditional method in regard with learning of vowel sounds (monophthongs) on pronunciation skill.

Table 4.11

Group Statistics of the Pretests of Group 1 and Group 2 for Monophthongs

Groups	N	M	S D	S E M
Pre Test Group 1	35	34.8286	6.78444	1.14678
Pre Test Group 2	35	34.8000	7.45496	1.26012

Table 4.12

Independent Samples t-test of the Pretests of Group 1 and Group 2 for Monophthongs

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% C I	
	F	Sig.	t	df	Sig. (2-tailed)	M D	S E D	LL	UL
Equal variances assumed	.191	.663	.017	68	.987	.02857	1.70382	-3.37135	3.42849
Equal variances not assumed			.017	67.405	.987	.02857	1.70382	-3.37189	3.42903

Table 4.11 shows that the number of respondents in Experimental Group 1 and Experimental Group 2 were 35 (N_{E1} =35; N_{E2} =35). The pretest gives the mean (34.82) for Experimental Group 1 and (34.80) for Experimental Group 2 which is almost the same means scores with slight difference. Standard deviation is (6.78 and 7.45) for the experimental group 1 and 2 respectively suggesting the difference from the mean value in the pretests results. Therefore, it could be inferred that both the values, i.e., mean and standard deviation are not statistically different as this difference is very small and it could not be called significant statistically.

Similarly, Table 4.12 gives more information about the Levene's test for equality of variances and t-test for equality of means. In Levene's test for equality of variances, F value suggested (.191) as it is not significant value to show the difference between both the groups. Furthermore, here in this table the p value is (.98) which is greater than p value: .05 (.98> 0.05). F value does not seem as significant in assumption of homogeneity of variances. That is why, it could be claimed that the results of both the groups are same without any significant difference. Additionally, the F value is (.191) and its significance is (.66) with the degree of freedom (68) and again the mean difference is only (.02) which statistically is very small. Thus, confidence interval is (-3.37 to 34.42) at 95% level of confidence. Likewise, “equal variances not assumed” and t value (0.17) and degrees of freedom (68) all these main findings expressed that there is no significant difference in the pretests of both the groups and both the groups are same in the pretests of monophthongs.

Table 4.13

Group Statistics of the Posttest of Group 1 and Group 2 for Monophthongs

Groups	N	M	S D	S E M
Pre Test Group 1	35	100.5714	13.85914	2.34262
Pre Test Group 2	35	45.0571	16.62907	2.81083

Table 4.14

Independent Samples t-test of the Posttest of Group 1 and Group 2 for Monophthongs

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% C I	
	F	Sig.	t	df	Sig. (2-tailed)	M D	S E D	LL	UL
Equal variances assumed	.143	.235	14.898	68	.000	54.51429	3.65905	47.21277	61.81580
Equal variances not assumed			14.898	65.861	.000	54.51429	3.65905	47.20848	61.82010

In Table 4.13, the statistical data was analyzed of Experimental Group 1 and Experimental Group 2. As this table is showing the sample size is 35 in each group. Then there is a mean difference of the both the groups (100.57) for Experimental Group 1 and (45.05) for Experimental Group 2, with the mean difference is (54.51). The standard deviation tells how far variances of one sample occurred from the mean value; here it is estimated at (13.85 and 16.62) for the experimental group 1 and 2 respectively with standard error mean (2.34 and 2.81) accordingly. The actual mean value is (54.51) which is highly significant value in the posttests of monophthongs.

Table 4.14 presents the Levene's test for equality of variances and t-test for equality of means. In Levene's test the F value is equal to (.143) with its significant level of (.235). However, the P value which is considered the most crucial findings in order to accept or reject the hypotheses. The P value is indicating a value of (.000) which is less than: 0.05 (.000 < 0.5) suggesting that both the groups are not equal in their pronunciation level at all. The t value is (14.89) with the degree of freedom (68). The confidence interval of the differences is ranged from (47.21 to 61.81) with its significance value.

To sum up the whole discussion in the posttest of monophthongs, it is claimed that the hypothesis No 2 is proved as the secondary school English language learners who were taught through CALL were better in pronunciation of vowels sounds than the learners who were taught through the traditional methods in Pakistan.

Table 4.15

Group Statistics of the Pretest of Group 1 and Group 2 for Diphthongs

Groups	N	M	S D	S E M
Pre Test Group 1	35	19.2286	2.80845	2.34262
Pre Test Group 2	35	17.9714	5.36045	2.81083

Table 4.16

Independent Samples t-test of the Pretest of Group 1 and Group 2 for Diphthongs

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% C I	
	F	Sig.	t	df	Sig. (2-tailed)	M D	S E D	LL	UL
Equal variances assumed	1.598	.210	1.229	68	.223	1.25714	1.02291	-.78404	3.29832
Equal variances not assumed			1.229	51.358	.225	1.25714	1.02291	-.79608	3.31037

In Table 4.15, the statistical data was analyzed of Experimental Group 1 and Experimental Group 2 for vowel sounds of diphthongs with the sample size 35 in each group (N_{E1} =35;N_{E2} =35). Then, the next remarkable value is the mean that is equal to (19.22 and 17.97) for the experimental group 1 and 2 accordingly with the mean difference (1.25) having very small difference. Standard deviation is (2.80 and 5.36). Accuracy of the samples is measured by standard error means which is (2.34 and 2.8) for both the groups. Here in the pretest of diphthongs the difference in the means and standard deviation are not proved statistically significant.

Additionally, in Table 4.16, Levene's test for equality of variances and t-test for equality of means exhibit that F value is equal to (1.59) that suggests that variance is equal with its value (.210). Both the groups have approximately similar values with slight difference; the variances do not fall far from the mean of the results in both the samples. Table 4.16 also exhibits the t value as (1.22) with the degree of freedom (68) and P value (.223 and .225) which is greater than p value: 0.05(.223 > 0.05) along with too little mean difference (1.25). The confidence interval is only (.-78 to 3.29) at 95% level of significance. Thus, all these above-mentioned values in Table 4.15 and 4.16 indicate that there is no statistically difference in performance of the two groups in the pretest of diphthongs and both the groups are statistically equal regarding their pretest performance in diphthongs.

Table 4.17

Group Statistics of the Posttest of Group 1 and Group 2 for Diphthongs

Groups	N	M	S D	S E M
Pre Test Group 1	35	63.8571	11.33745	1.91638
Pre Test Group 2	35	22.9714	9.48834	1.60382

Table 4.18

Independent Samples t-test of the Posttest of Group 1 and Group 2 for Diphthongs

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% C I	
	F	Sig.	t	df	Sig. (2-tailed)	M D	S E D	LL	UL
Equal variances assumed	.569	.453	16.361	68	.000	40.88571	2.49895	35.89914	45.87229
Equal variances not assumed			16.361	65.953	.000	40.88571	2.49895	35.89633	45.87510

Table 4.17 gives the impression that in the posttest results of the Experimental Group 1 and Experimental Group 2 for vowel sounds of diphthongs, the sample size is 35 in each group (N_{E1} =35; N_{E2} =35). The mean difference is output as (63.85) for Experimental Group 1 and (22.97) for Experimental Group 2 with the mean difference (40.88) suggesting a statistically significant difference between the two groups. The standard deviation is (11.33) for Experimental Group 1 and (9.48) for Experimental Group 2 with the difference (2.49). While Table 4.18 tells about Levene's test for equality of variances and t-test for equality of means. Here in this table F value has increased value (.569) which is greater than its significant value (.453). Again, P value is (.000) which is lesser than the P value: .05 (.000< .05) means the equal variances are not assumed and both the samples are statistically different from each other. Therefore, on the basis of these findings it could be said that learners who were taught by CALL have better pronunciation of vowel sounds (diphthongs) than the learners who were taught by the traditional method. Hypothesis No 2 was approved here numerically and statistically and it answers the question No 2: Is there significant difference between the effects of CALL and traditional method on English language learners 'pronunciation of vowel sounds in secondary school in Pakistan?

Surely, there is a significant difference between the effects of CALL and teaching pronunciation without CALL on English language learners who were taught vowel sounds through computer and who were taught pronunciation without CALL.

4.2.3 Research Hypothesis No 3

In the current research, the third objective was made to evaluate the effects of CALL and traditional methods on learning of consonant sounds of English language learners in secondary school in Pakistan. To achieve this objective the hypothesis was:

H3: The secondary school English language learners who are taught through CALL are better in pronunciation of consonants sounds than the learners who are taught pronunciation without CALL in Pakistan.

All the collected data was analyzed through SPSS independent Sample t-test. The comparison of the pretest and posttest was performed to examine the difference between the pretest and posttest analysis. Data analyzed through SPSS t-test is shown in the following tables.

Table 4.19

Group Statistics of the Pretest of Group 1 and Group 2 for Consonants

Groups	N	M	S D	S E M
Pre Test Group 1	35	62.6571	8.81824	1.49055
Pre Test Group 2	35	61.8857	9.27606	1.56794

Table 4.20

Independent Samples t-test of the Pretest of Group 1 and Group 2 for Consonants

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% C I	
	F	Sig.	t	df	Sig. (2-tailed)	M D	S E D	LL	UL
Equal variances assumed	.028	.867	.357	68	.723	.77143	2.16338	-3.54552	5.08838
Equal variances not assumed			.357	67.827	.723	.77143	2.16338	.3.54572	5.08858

Looking at the above statistics in Table 4.19 there is impression that in the pretest mean difference of the experimental group 1 and 2 for consonant sounds (62.65 and 61.88) for both the groups respectively with slight difference (.723). The sample consists of 35 in each group showing the same sample size. The standard deviation is measured at (8.81 and 9.27) for Experimental Group 1 and Experimental Group 2, which determines that how much the results of both the groups are far from the mean value. The standard error mean is (1.49 and 1.56) for both the groups. So, the difference between is (.723) which is not statistically significant. It means both the groups have almost the similar findings in the pretests.

Next, Table 2.20 presents the Levene's test for equality of variances and t-test for equality of means. F value is tabulated as (.028) with its significant value (.867) which does not show any statistically significant value. T-value is equal to (.357) and p value (Sig 2-tailed) (.723) which is greater than p value: .05 (.723> 0.05) suggesting no significant value in both the samples of Experimental Group 1 and Experimental Group 2. The both the groups have similar findings in the pretests results. Again, in the light of equal variances assumed or equal variances are not assumed, these variances are almost the same without observing any significant difference.

Table 4.21

Group Statistics of the Posttest of Group 1 and Group 2 for Consonants

Groups	N	M	S D	S E M
Pre Test Group 1	35	136.1143	27.11064	1.49055
Pre Test Group 2	35	57.6286	7.24807	1.56794

Table 4.22

Independent Samples t-test of the Posttestt of Group 1 and Group 2 for Consonants

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% C I	
	F	Sig.	t	df	Sig. (2-tailed)	M D	S E D	LL	UL
Equal variances assumed	37.7	.000	16.546	68	.000	78.48571	4.74348	69.02025	87.95118
Equal variances not assumed			16.546	38.83	.000	78.48571	4.74348	68.88982	88.08161

Table 4.21 exhibits the statistically analysis of the posttests of Experimental Group 1 and Experimental Group 2 for consonant sounds. Again, the sample size is 35 in each group. Then there is a mean of both the samples which is equal to (136.1143 and 57.62) for the experimental group 1 and 2 respectively with the mean difference (78.48). The standard deviation gives much information about the variances as how far from one sample is from the mean value of other sample. Table 4.21 shows the value for standard deviation as (27.11) for Experimental Group 1 and (7.24) for Experimental Group 2. The standard Error means shows the figures (1.49 and 1.56) for Experimental Group 1 and 2 accordingly. These results indicate that there is significant difference between the results of the two samples, i.e., Experimental Group 1 and Experimental Group 2.

Similarly, Table 4.22 indicates the Levene's test for equality of variances and t-test for equality of means. In this portion, the F value is equal to (37.7) which is greater than its significant value (.000) creating a significant difference between the two groups. T value is too bigger as (16.54) with degree of freedom (68). Importantly, p value related to the sig. (2-tailed) is less than (.05) which is: .000 (.000 < 0.5) which determines the overall findings of the samples. The average sample difference is measured by the standard error difference which is (4.74). The confidence interval suggests the findings (69.02 and 87.95).

Thus, on the bases of all these above-mentioned results, it has been claimed that Experimental Group 1 which was taught consonant sounds through computer, performed better as compared to the group who was taught consonant sounds without using CALL and they also answer the question:

Is there significant difference between the effects of CALL and teaching pronunciation without CALL on English language learners' pronunciation of consonant sounds in secondary school in Pakistan?

There is significant difference between the effects of CALL and teaching pronunciation without CALL on English language learners' pronunciation of consonant sounds in secondary school in Pakistan.

4.3 The Findings of the Study for Pronunciation (Overall)

4.3.1 The Research Hypothesis 1

The purpose of the current study was to examine to the effect of computer assisted language learning on pronunciation of secondary school learners in Pakistani context. The study had three hypotheses to be proven for dependent and independent variables, i.e., CALL and the traditional method for teaching pronunciation. The participants were divided into two groups as Experimental Group 1 and Experimental Group 2. To achieve all the objectives of the study and to claim the said hypotheses, 1-9-point Likert scale was used to the items in the pretests and posttests. The both the groups were pretested, given treatment and then posttested. The data got by Likert scale was analyzed using Independent Sample t-test. Intragroup comparison was also performed using Paired Sample t-test. After discussing data analyses findings of independent sample t-test and paired sample tests, the hypothesis No 1 was proven statistically that CALL treatment improved pronunciation of the secondary school English language learners and a

significant difference was founds between the pretests and posttests results of both the groups.

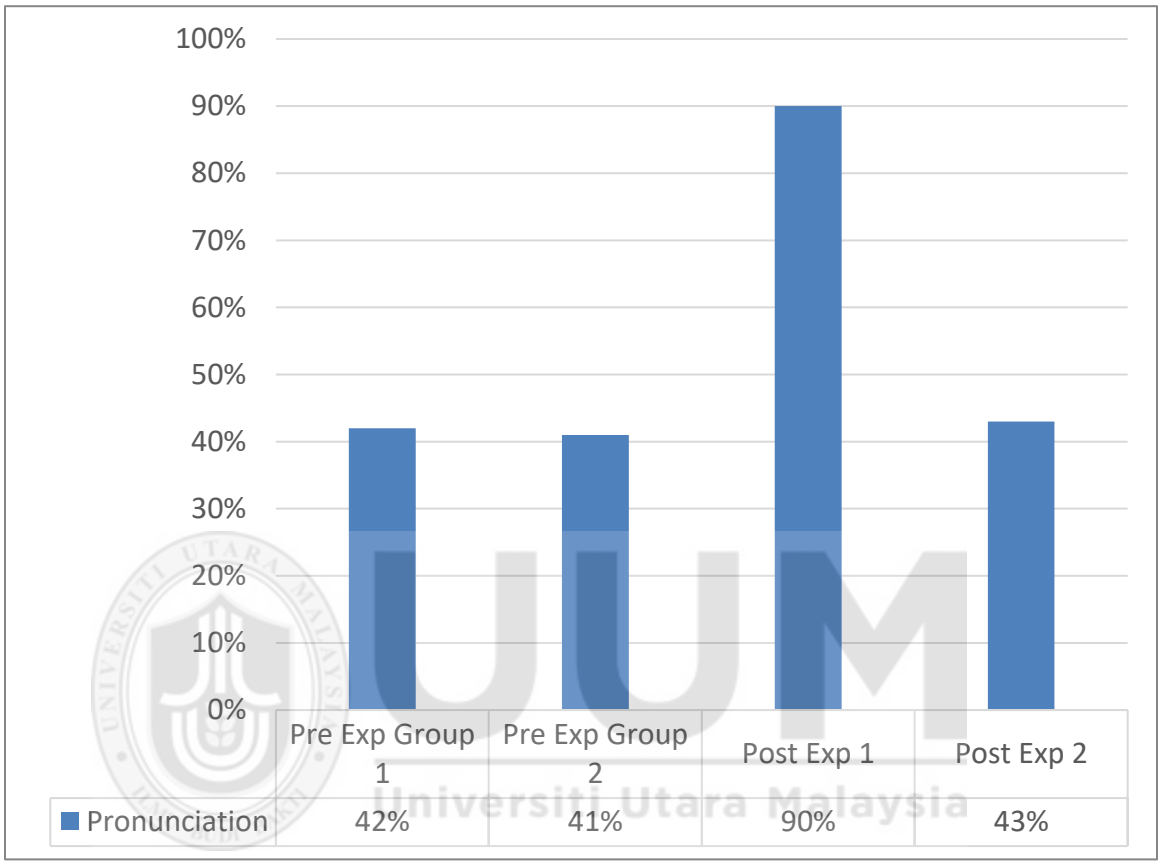


Figure 4.1 Pretest, Posttest Experimental Group 1 and Experimental Group 2

In Table 4.1 and Table 4.2 (discussed earlier in this chapter) the mean value for Experimental Group 1 was: 122.28 (X_{ex1}=122.28) and for Experimental Group 2 the mean valueswas:114.65 (X_{ex2}=114.65). The P value was equal to (.012). All these findings indicated that there was no significant difference in both the groups as they both the groups had almost similar proficiency level of pronunciation of English language in the pretests. Similarly, Figure 4.1 also shows the same values mentioned earlier. Experimental Group 1 secured 42% while Experimental Group 2 got 41% approximately

similar percentages in the pretests results. However, the posttest results indicated that p value was lesser than: .05 (.000 < 0.05) (see Table 4.4) suggesting that there was significant difference between the pretest and posttest results. This significant difference of the results confirmed the hypothesis 1. As the learners who were taught through computer have better pronunciation as compared to those learners who were taught by the traditional method. Similarly, Figure 4.1 also indicates this significant difference through percentages. Experimental Group 1 got 90% and Experimental Group 2 secured 43% in the posttest results. All these findings confirmed the effectiveness of CALL treatment in regard to improve pronunciation skill. AbuSeileek (2007) also received positive response by using computer technology. However, he addressed the suprasegmental feature, i.e., stress pattern for EFL learners.Findings of Gambari et al. (2014)'s study also confirm the findings of the current research. Their research was on both the features, i.e., segmental and suprasegmental and they got better performance from the learners who were taught pronunciation by computer. Alipanahi (2014) got better results while teaching stress pattern through technology aided instructions to EFL Iranian learners.

4.4 The Findings of the Study for Monophthongs and Diphthongs (Vowel Sounds)

4.4.1 Findings of Hypothesis No 2

Since, the objective No 2 was to evaluate the effectiveness of CALL regarding vowel sounds (monophthongs and diphthongs) and the second hypothesis was:

H2. The secondary school English language learners who are taught through CALL are better in pronunciation of vowels sounds than the learners who are taught pronunciation without CALL in Pakistan.

Looking at Table 4.11 the mean of both the groups is under the range (34.82-3480) while Table 4.12 presents the p value as (.987) which is more than: .05 (.987 > 0.05) suggesting that there was no significant difference in the pretests, both the groups got almost the same results. Similarly, as far as monophthongs and diphthongs are concerned; in the pretest, Experimental Group 1 achieved 32% in monophthongs while Experimental Group 2 got 31% in monophthongs (see Figure 4.2 & Figure 4.3). While Experimental Group 1 secured 27% for diphthongs and Experimental Group 2 got 25% with minor difference, approximately same results were gotten in the pretests results of both the groups for monophthongs and diphthongs.

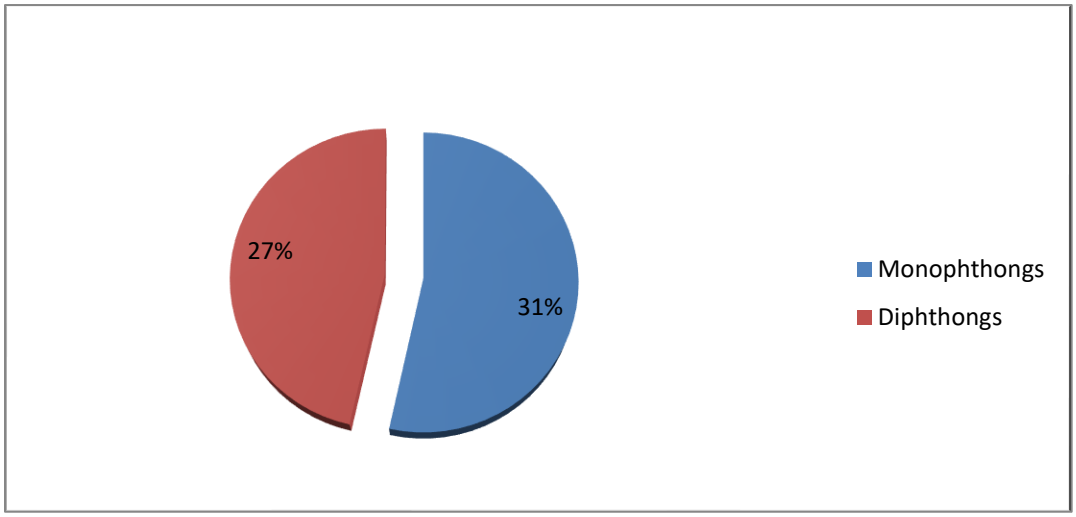


Figure 4.2 Pretest of Monophthongs and Diphthongs for Experimental Group 1

The pretests meet the expectations that both the groups must show the same level of homogeneity aspects.

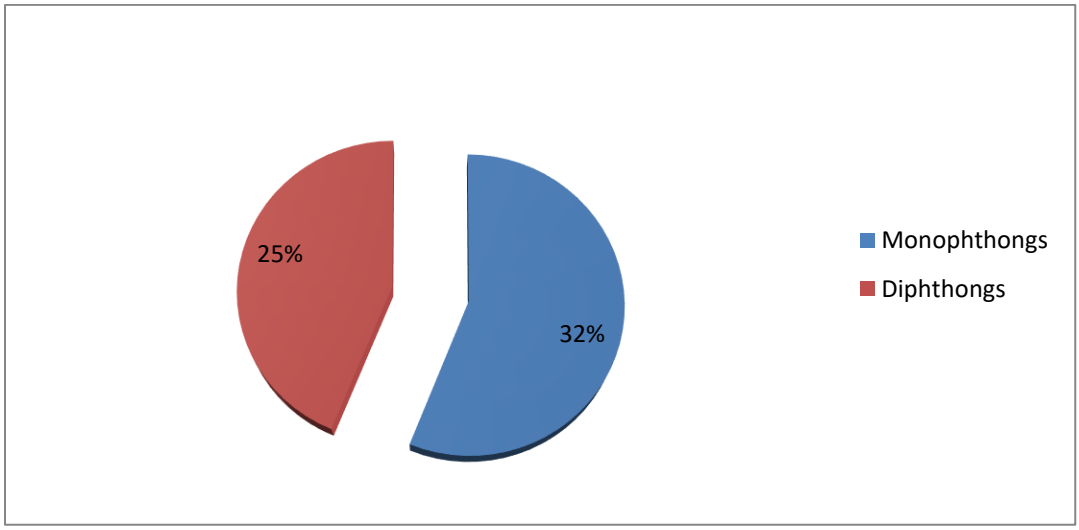


Figure 4.3 Pretest of Monophthongs and Diphthongs for Experimental Group 2

However, as far as monophthongs are concerned, Table 4.13 presents the mean value as (100.57) for Experimental Group 1 and (45.05) for Experimental Group 2, indicating a great difference in the mean value with the mean difference of (51.54) which is statistically a great mean difference between both the samples. Whereas, Table 4.14 shows p value as (.000) which less than p value: .05 (.000 < 0.05). As the p value is considered the main findings whether a difference between two samples exists or not. The percentages in gotten scores for the posttest of monophthongs and diphthongs also confirmed that in the posttest results, Experimental Group 1 outperformed and got better results in the learning of vowel sounds (both monophthongs and diphthongs). Figure 4.4 and Figure 4.5 denote the same results in percentages. Experimental Group 1 got 90% in monophthonogs and 86% in diphthongs, showing a great difference from the Experimental Group 2 as that group achieved 41% in monophthongs and 29% in diphthongs, indicating a great difference between two the samples.

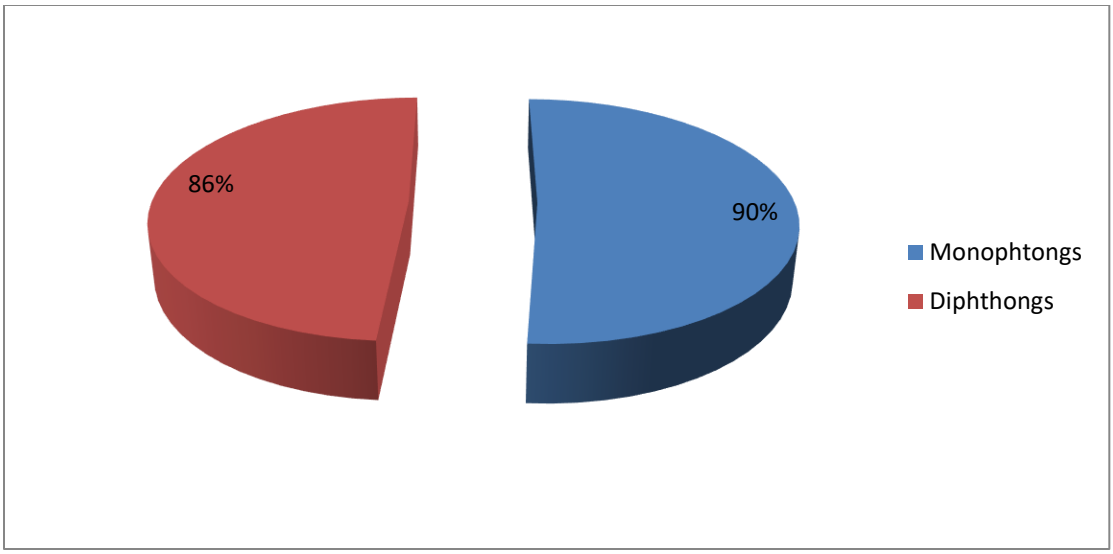


Figure 4.4 Posttest of Monophthongs and Diphthongs for Experimental Group 1

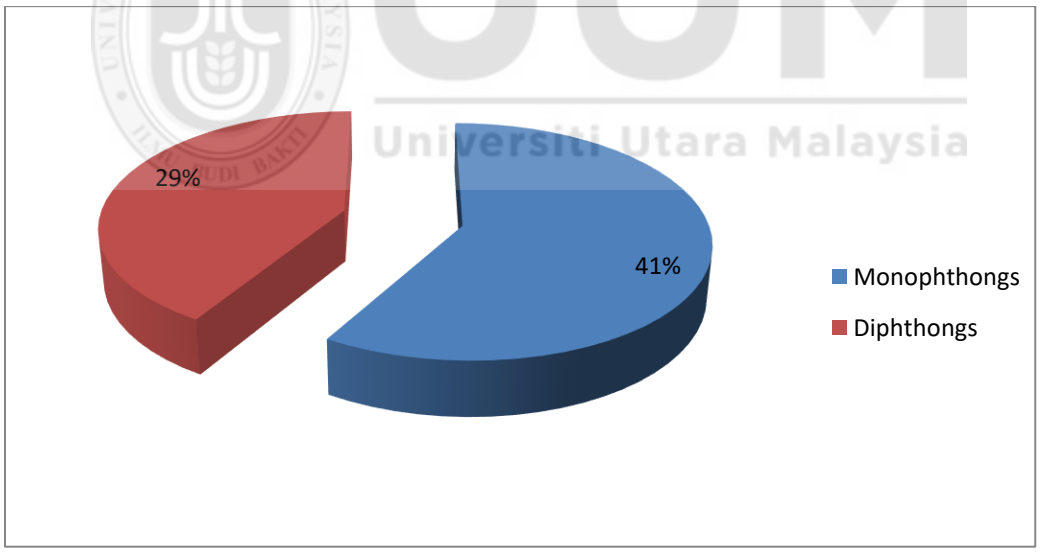


Figure 4.5 Posttest of Monophthongs and Diphthongs for Experimental Group 2

The findings of hypothesis No 2 are in line with the research performed by Hismanoglu and Hismanoglu, (2011) on Turkish EFL learners. The Learners were taught only vowel chart, monophthongs, diphthongs and tripthongs. Hismanglu and Hismanoglu also got

better results using CALL program to teach vowel sounds to the learners. Saito (2011) also got positive response from Japanese learners on learning 8 segmental sounds through computer. Neri, Gerosa and Giuliani (2008) have similar findings of computer assisted pronunciation training system. After the treatment, both the groups showed significant improvement as both the groups given special innovative treatment via computer software.

4.5 The Findings of the Study for Consonant Sounds

4.5.1 Findings of Hypothesis No 3

The current study had third objectives as to evaluate the effects of CALL and teaching pronunciation without CALL on learning of consonant sounds of English language learners in the secondary school in Pakistan and the study was hypothesized as: Learners who are taught by CALL have better pronunciation of vowel sounds than the learners who are taught pronunciation without CALL.

Looking at Table of 4.19 in the pretests of consonants for both the groups the mean gotten by both the groups was measured as (62.65) for Experimental Group 1 and (61.88) for Experimental Group 2 with least mean difference (.77) which was not statistically different in the terms of scores for both the groups in the pretests. The sign 2-tailed p value was equal to (.723) shown in Table 4.20 in the pretests again denoted that the both the groups had equal competency level for consonant sounds in the pretests. As well as Figure 4.6, gives approximately the same values 32% for Experimental Group 1 and Experimental Group 2 got 30% scores in the pretest samples.

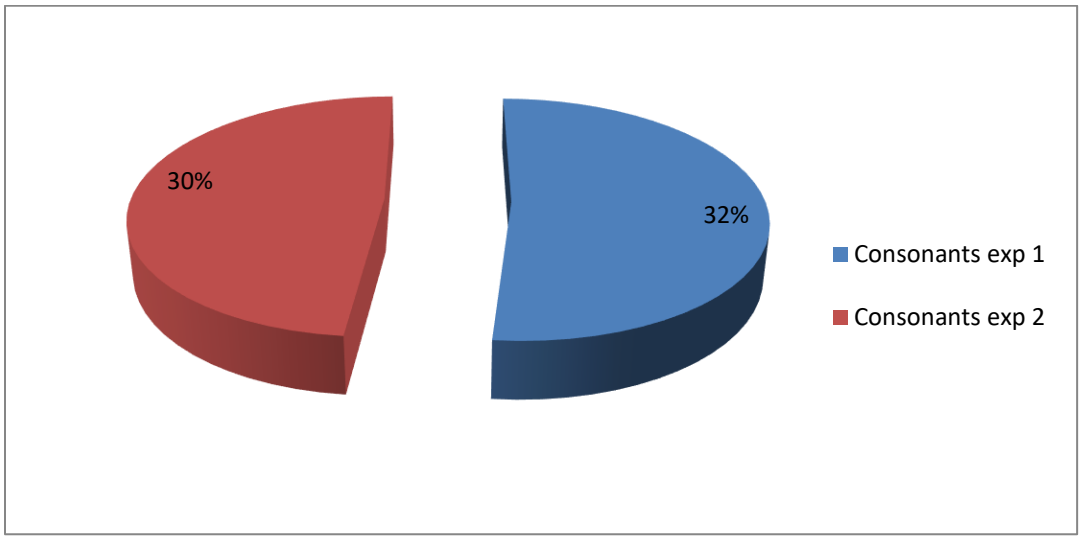


Figure 4.6 Pretest of Consonants Experimental Group 1 and Experimental Group 2

Figure 4.6 shows 35% scores for Experimental Group 2 and 86% for Experimental Group 1, suggesting a significant difference in scores of both the groups.

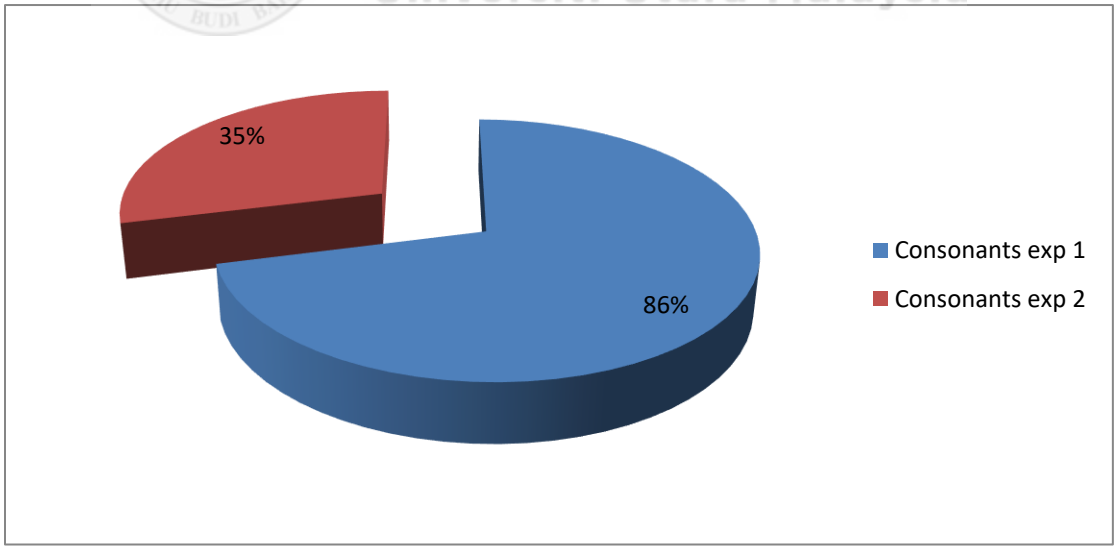


Figure 4.7 Posttest of Consonant for Experimental Group 1 and Experimental Group 2

On the other hand, the posttest results of Independent Sample t-test in Table 4.21 were evaluated as mean values for both the groups (136.11 and 57.62) for Experimental Group 1 and Experimental Group 2 respectively with the significant mean difference of (78.48). The sig 2-tailed was equal to (.000) less than: .000 < 0.05) also indicated as significant posttest results. Similarly, the scores percentages shown in Figure 4.7 indicate that Experimental Group 1 got 86% results in the posttest of consonants. Nevertheless, the posttest results of Experimental Group 2 show slight improvement from 30% to 35%. However, this difference is not important as compared to the Experimental Group 2, which shows numerically significant results of 32% to 86% in consonant sounds. Moreover, the hypothesis No 3 is also validated as learners who were taught by CALL had better pronunciation of consonant sounds than the learners who were taught by the traditional method.

Olson (2014)'s study on the segmental level got positive results though CALL software. Kumar and Madhavi (2012) achieved significant findings through CALL program on IPA sounds. The findings of Lambacher (1999)'s study, are in the same line with the current research regarding improvement of IPA consonant sounds. Neri et al. (2002) have the opinion that "technology offers for practicing oral skills and addressing pronunciation problems, two areas that are hard to improve within traditional class-based settings" (p. 40). They add that the use of computer for pronunciation teaching makes a learner, to some extent, an autonomous learner who becomes responsible for his/her own learning and gets awareness of his/her own deficiencies and drawbacks.

4.6 Summary

This chapter highlights the results and findings of quantitative data analysis tools. Descriptive statistics were analyzed by SPSS (version 23). T-test and paired sample statistical data analysis tool were employed to prove the said hypotheses. Means score of the pretest and posttest measures showed the significant difference between the achievement of Experimental Group 1 and Experimental Group 2 in pronunciation of vowel sounds. All the hypotheses are validated and overall findings are that the computer and digital dictionary have significant effects on learning of IPA pronunciation sounds on the secondary school English language learners in Pakistan.

CHAPTER FIVE
DISCUSSION, RECOMMENDATIONS AND CONCLUSION

5.1 Introduction

This chapter is designed to discuss the overall findings of the present study. It maintained the review of overall findings in the light of stated hypotheses as well as the implication of the current research. Some unexpected issues are also discussed in this chapter along with the strength of the current research. Apart from this, the ethical issues and the limitations of the study are also explained here in this chapter. The recommendation for future researches and conclusion, all are elaborated in the end of the chapter.

5.2 Overall View of the Current Research

To prove the stated hypotheses of the current study, the researcher had to exercise an almost one year's time painstakingly with much dexterity for data collection and data analysis. Initial 6 months' time was spent on collecting data, such as visiting different schools for research purpose, selecting a particular school, meetings with school principal, introduction of the research plan, approval of consent form, selecting the participants, deciding the treatment type and group until the launching the actual treatment. Next 6 months' period was spent on the analysis of the collected data both manually and through systematic quantitative analysis measures with taking minute care and precision throughout the procedure. According to the actual plan, the duration of the study was 8 weeks; however, only 6 weeks treatment (46 hours) was performed due to the final exams of 10^{th} graders.

In the current research, 70 participants were selected for intervention and they were divided into two groups 35 participants in each group. After forming the groups (Experimental Group 2 and Experimental Group 1) the pretest for both the groups was conducted. Then both the groups were taught 44 sounds of IPA phonemic chart. Finally, both the groups were posttested and data was analyzed. Quantitative data inferential statistics were employed for the present data of this study and the data was analyzed through the Statistical Packages for the Social Sciences SPSS (version 23).

The overall significance level was observed less than $p<.05$ in all the statistical analyses. All the procedure was performed through different stages. The scores in the pretests and posttests were gotten through tick base on 1-9-Likert scale and then were transcribed by the human raters. Different researchers used the Likert scale in their researches. Such as Derwing and Munro (1998), Harding (2012), Algethami, Ingram and Nguyen (2011), Ruellot (2011), Lima (2011),), Gordon et al. (2012). All of these researchers used 5-point or 9-Likert scale in their respective studies.

Quantitative data was analyzed manually as well as using SPSS (version 23). The findings of the posttest results of both the groups showed that the learners who got innovative treatment by computer over performed the learners who received the conventional classroom instructions. The learners liked the idea of learning of pronunciation through videos of native speakers because those videos were very attractive and having native pronunciation models. All the proposed hypotheses were accepted through statistical analysis of the collected data. The findings of the study are in line with the studies conducted by Papachristou (2011), Cunningham (1990) and Saito

(2011). They confirmed that CALL has significant effect on pronunciation of English language learners.

5.2.1 Overall Findings of Hypothesis No 1

According to the findings of the current research, a significant difference was found in the mean results of both the posttests of Experimental Group 1 and Experimental Group 2, as the both having means 347.11 for Experimental Group 1 (X_{ex1}=347.11) and 134.37 (X_{ex2}=134.37) for Experimental Group 2 in overall pronunciation posttests with significant p value .000 which is less than p value .05 (.000 < 0.05). Paired Sample posttest of Experimental Group 1 also indicated the same findings as in the pretests 122.28 and the posttest 286.37 as well its significant p value is .000 less than .05. Again, Figure 4.1 also indicated the same findings in the pretests and posttests of overall pronunciation. In the pretests of both the groups who have 42% and 41% for Experimental Group 1 and Experimental Group 2 while in the posttests, Experimental Group 1 got 90% and Experimental Group 2 secured 43% in overall pronunciation. All these findings give the impression of significant improvement was examined in the posttests results. First hypothesis is dually accepted by independent sample t-test and paired sample t-test.

5.2.2 Overall Findings of Hypothesis No 2

In the posttests results of monophthongs Experimental Group 1 and Experimental Group 2 both the groups received the mean value as 100.57 and 45.05 respectively

(X_{ex1}=100.57, X_{ex2}=45.05) with significant difference could be observed by Experimental Group 1. Again, p value for posttest of monophthongs is also less than: .05 (.000 < 0.05). As far as the posttests of diphthongs is concerned, further significant difference is shown through Table 4.17 by indicating 63.85 for Experimental Group 1 and 22.97 for Experimental Group 2 with significant p value of less than: .05 (.000 < 0.05). Figure 4.3 tells that in the posttest of monophthongs Experimental Group 1 got 90% in monophthongs and diphthongs 86%. On the other hand, Experimental Group 2 got 41% in monophthongs and 29% in diphthongs, almost the same with the posttest of Independent sample t-test. Therefore, on the bases of these posttest results hypothesis No 2 is accepted.

5.2.2 Overall Findings of Hypothesis No 3

The posttest results of consonant sounds suggest that Experimental Group 1 got 136.11 and Experimental Group 2 57.62 (X_{ex1}=136.11, X_{ex2}=57.62) a remarkable difference could be seen by the samples of both the groups with significant p value .000 less than: .05 (.000 < 0.05). Regarding consonants, Figure 4.6 suggests that in the posttest Experimental Group 1 achieved 86% whereas, Experimental Group 2 got 35% in consonant sounds. These posttest findings also reveal that hypothesis No 3 is accepted. Thus, on the bases of obtained results it is also highlighted that the learners who got computer-augmented pronunciation teaching have better consonant sounds than the learners who are taught pronunciation in traditional classroom.

Therefore, it could be claimed that computer has significant positive effect on pronunciation of second language learners at the secondary school level in Pakistan. The findings of the current research correspond to Nadeem et al. (2012)'s study. They found significant improved results in pronunciation sounds of the second language learners in Pakistani context. However, their study was regarding both, i.e., segmental and suprasegmental features of pronunciation. The learners tried to differentiate the sounds consciously by doing practice on computer technology. Lee (2008) also has significant improved results after conducting her study regarding pronunciation teaching through CALL. Gorjian, Hayati and Proukhoni (2013) also harmonize the findings of the current research. They investigated the effects of pronunciation software (Praat) to improve the prosodic features of English language and significant improvement in pronunciation was noted by the experimental group. Van Han and Rensburg (2014) used CALL oriented treatment to improve TOEIC (Test of English for International Communication listening skill). The learners of the Experimental Group 1 performed better through CALL augmented instructions in listening scores than the learners of Experimental Group 2 who used textbook only. Furthermore, Liu and Hung (2016), Chapple (2003) and Neri et al. (2002) also found positive results by using CALL program to improve pronunciation.

5.3 Research Design Incorporating Research Hypotheses

Since, the current study was exercised in Pakistani context about the effectiveness of computer-augmented instruction on pronunciation of English language at secondary school level. The relationship between dependent and independent variables was evaluated. The quantitative data was analyzed to prove the stated hypotheses and it was

discussed in the chapter four with sufficient detail. Data analyses reveal that the research hypotheses, which were addressed in the current research, all were proved on the bases of significant findings. Systematic data analysis tools i.e. Independent Sample t-test and paired sample test, inter group and intragroup comparisons were performed to examine the effect of CALL on pronunciation sounds. According to the findings of the current research, all the above-mentioned research hypotheses were accepted statistically and no single research hypothesis was rejected.

5.4 Implications of the Current Research

5.4.1 The effectiveness of CALL and Improvement of Pronunciation Skill

In the modern world, the use of computer has become an essential entity in an educational setup to cope with the societal needs. As far as language learning is concerned, it is the most difficult task to deal with the oral skills particularly the pronunciation problems regarding the secondary school learners. This issue becomes more critical especially in Pakistani context as learners are not familiar with pronunciation sounds. The current research was an initial step in this regard. Although, different researchers used several pronunciation software to teach pronunciation. However, the findings of this research suggest that still there are some issues regarding pronunciation software, which need to be resolved before launching these software. As in the current research, researcher initially wanted to use *MyET* pronunciation software used by Lee (2008), however, it was found later that software was according to the need of suprasegmental features, i.e., stress, pitch, timing and emphasis were main features of

that program and it was not suitable to teach segmental phonemic sounds as was the purpose of the current research. Sometimes, the appropriate software is selected according to the need of the learners, and again there are some other issues regarding availability of contextualized material in the local market as well as some problems related to financial issues are also existed. Therefore, it will take time to manage all issues regarding selection of the pronunciation software.

Then, the second software was "Pronunciation Coach" that was selected as tool for digital scoring in the pretests and posttests. During the pretesting, it was also realized by the researcher that Pronunciation Coach provided wrong digital scoring. As the learners were pronouncing the words wrongly and it was assigning them 90 and sometimes more than 90 grades out of 100 for wrong pronunciation. That is why, the researcher stopped using this software for the pretest and she recorded the voices of all the participants of both the groups and then all the recordings of pretests and posttests were evaluated on 1-9-Likert scale by the panel of judges. Derwing, Munro and Carbonaro (2000) argued in the same manner and stated that software are unable to fully understand the human sound patterns and it is wrong to say that through these software accuracy level was around 70% in the speech of nonnative speakers.

5.4.2 Difficulty in Learning the Vowel and Consonant Sounds

Furthermore, the learners of both the groups found difficulty in mastering vowel sounds. The distinction between the short vowel and long vowel were another reason for their anxiety. They had to face a lot of difficulty in uttering these short and long sounds of

vowel. They were confused in pronouncing the long /i:/vowel sound and short /i/ vowel sound mainly that is more difficult in recognizing the difference in quality rather than length. They were given different examples of words comprising short vowels and long vowels. Single vowel sounds as compared to double vowel sounds were easier for the participants. Nevertheless, they hesitated to identify sound symbols and they found that to get mastery over double sound symbols was also very difficult for them.

As a whole, it can be concluded that the vowel sounds were not easy for the participants. To get proficiency level over all the sounds and full understanding, it requires more time and continuous practice by the learners. If the duration could be expanded there would be possibility of more positive outcomes by doing practice and imitating all those difficult sounds of native models. As Hietanen (2012) discussed this point that in the pronunciation of vowels the distinction between /i:/and /i/ especially was the cause of trouble for Finnish learners of English. Thus, they should be provided examples of words that only differ in quality, not in length as in *beat* [bi:t] vs. *bid* [b/id]. Some other difficult sounds like /ɜ:/ 'turn', /æ/ 'hat' and /ɒ/ sound as in 'on' were most difficult sounds for participants of both groups. The learners felt much difficulty in learning vowels, especially double vowel sounds (diphthongs).

Additionally, sounds such as /eɪ/ sounds in 'pay', /ʊə/ sound in 'poor', /əʊ/ sound in 'nose'. The last sound of /əʊ/ was the most confusing sounds and majority of the participants of both the groups pronounced it wrongly. Even though Experimental Group 1 was receiving instructions through watching accurate native sounds by a native instructor and observing the relevant symbols for particular sounds in digital dictionary, however, they felt difficulty to pronounce these sounds. As Pakistani speaker do not

pronounce the double sounds instead they skip one sound and utter only one sound of all diphthongs. Hassan (2014) also expressed the same view by stating that Pakistani learners have to face much difficulty in learning of vowel sounds as compared to consonant sounds.

As far as consonant sounds were concerned, although these sounds were easy to learn yet some consonants were problematic for the participants of both the groups. For example, the voiced and unvoiced sounds such as the sound /ð/ 'the' and the sound of /ɸ/ 'three', were the cause of making mistakes but overall the result of the consonant sounds was better than the vowel sounds results. Similarly, the identification of the sound /ʃ/ 'cushion' learners felt hesitation while uttering this sound.

5.4.3 Difficulty regarding Aspirated Sounds felt by the Participants of Experimental Group 2

Another, remarkable observation was examined on the participants of Experimental Group 1, they all were very excited during the treatment and after the treatment in the posttest. They were more confident and performed much better than the learners of Experimental Group 2. They recognized the aspirated sounds like /p^h/, as in word 'pen', /t^h/ in 'table' and /k^h/ in 'cake'. On the other hand, participants of Experimental Group 2 were unable to identify the aspirated sounds. Because Pakistani speakers do not make differentiation between aspirated and un-aspirated sounds. They pronounce un-aspirated sounds only. So, if the learners dependent on their teachers only, they would not be able to learn this very important component of pronunciation sounds according to the

international demands. As phonetic videos and digital dictionary helped the learners to listen the native speakers with aspirated aspect of the pronunciation sounds.

5.4.4 Slight Improved Results Manifested by Experimental Group 2

Although, the actual purpose of the current study was to examine the effects of CALL for which all the research procedure was performed. However, it was observed by the researcher, that the participants of the Experimental Group 2 got slight improvement in the results of posttests. However, those results were not significant as compared to the Experimental Group 1. However, some sort of improvement was performed by Experimental Group 2. It means, the traditional treatment was also proved as helping agent. This notion assists the design of the study, that if control group was not given treatment as in some of the researches, control group was not given such as Saito (2007) did not assign any treatment to the control group. So, one could not evaluate the findings in accurate way, whether the improvement in the posttest results is the cause of innovative treatment or any other extraneous variable was involved. i.e. maturation for instance. Therefore, in the current research, the researcher gave treatment to both the groups though, the nature of the treatment was different.

5.4.5 Unexpected Issues and Difficulties Regarding Conducting the Current Study

Some unexpected problems were observed by the research during the implementation of the actual study. Some were related to the school management, computer laboratory, computer software and hardware problems, discipline problems, while some were

regarding time management. Nevertheless, the issues regarding selecting school, management and shortfall of electricity (Pakistani nation was facing serious and unending issues of electricity failure those days) were very crucial.

Additionally, in the process of selecting public school to actualize the research hypotheses; there were some steps in selecting the school for the current research. Firstly because of some security issues (bomb blasting in schools, universities) administrations of government schools were not welcoming and showed some sort of rigidity to the researcher even sometimes entrance was not allowed. The researcher was not aware of all that situation prior to the initiation of the study. Secondly, it was very critical period regarding secondary school learners because after three months, they had to appear in the final exams. The researcher met a principal of high public school. She refused to hand over the learners in the month of December 2016 and January 2017, since the learners were busy in preparation for final exams which were going to be held in March 2017. "In school-based research, teacher researcher will be faced with ethical and moral dilemmas" (Hitchcock & Hughes, 1995, p. 45). Therefore, apparently it was unethical to conduct study at that crucial period. However, the researcher had no other option except to fulfill her research program. That is why, sometimes, a researcher violates the ethical concerns due to unavoidable circumstances.

Furthermore, next week, the researcher consulted another school somehow and used some personal contacts to approach the school via her husband. The researcher's husband was the Deputy District Education Officer in the Department of Education Punjab. Anyway, all the relevant matters were resolved and eventually, the Vice Principal happily agreed with the researcher and allowed her to enter the school to fulfill the research

program accordingly. Cohen et al. (2007) expressed that important figures and administrators such as deputy head or senior teacher of an organization might be consulted and they would be proved very helpful in conducting a research.

Although, the researcher's plan was restricted to teach them 44 IPA sounds only; however, on principal's request she had to train them for introductory speaking sentences such as "what is your name?", "How are you?" and "What is your favorite subject?" and some more other introductory sentences of initial level conversation. Thus, the learners were given extra time for this training (10 minutes per session) and this activity was apart from the actual research, so it was not including in the current research. Learners were very excited as they were involved in English speaking classes. However, it proved a useful strategy to make the learners enthusiastic and fully involved in the actual treatment.

5.4.6 Computer Lab a Censored Area for English Language learners

There were three rows of computer tables, on which there were about 20 computer sets, kept on those computer tables. Each set was complete with an Intel Pentium 4 CPU, a desktop monitor, a keyboard and a mouse. All computer sets were still packed as new and the packing was untouched. At the corner of the lab, there was a table of computer teacher that the only computer which was in working position. It was unpacked and all wires connected and that was the single set in running position. That particular system was used for the purpose of typing and composing of official documents of the school.

In fact, the major problem that the researcher had to face there, no system (except teacher's computer) was fully installed with all the required connecting wires and all the devices had to be connected to bring the system in running position. Different parts of each system were set in their positions, CPUs under the tables, keyboards on the wooden board of the table and desktop monitors on the tables but the wires were all set aside besides each system. Upon the researcher's query, the learners told that they had never visited the lab for their learning purpose. Lab room was used only as an examination hall, for examination purposes only, since a large number of students could be accommodated in lab room at a time.

Thus, it was an additional task for the researcher to manage all the settings to be ready for use along with the installation of some software. Researcher got help of an IT expert to assist the researcher to maintain all equipment regarding hardware and software as well. All the required software were installed. If all the computers would be in working position, the researcher could save a lot of time. Anyway, the main point that all the required things were available at least at one place.

When the researcher started the actual study and brought the learners of Experimental Group 1 in to computer lab. Some of the English teachers of that school were curious about the combination of teaching English (not pronunciation because, majority was unknown to this term) and computer. There were questions even by English teachers said, such as "what pronunciation is?", "Why we need to teach pronunciation to the learners if there is no exams?", "It is wastage of time". "We must invest time to improve the other skills like reading and writing". Even a teacher suggested the researcher ought to do PhD in Urdu language in (national language of Pakistan) rather in English language" etc.

Moreover, the two teachers who were appointed by the school principal to assist the researcher in maintaining the class discipline, one teacher was for Experimental Group 1 (in computer lab) and one teacher was for Experimental Group 2. They both attended all the sessions given by the researcher. At the end of the program, they were very obliged and thankful for providing them such a useful program. Their assistance was greatly helpful for the researcher in maintaining the discipline; otherwise, it would be another issue for the researcher to control the class. The participants understood their teacher's language, if they said in loud voice just one time, "Girls!" then there was a complete silence for prolonged period and they started to work without any disruptive behavior.

5.4.7 Issues Related to Electricity Failure

While conducting the entire study, the researcher had to face some other unexpected issues. Some of them were resolved by the passage of time but some of them were persistent until the end of the research. First, there was an electricity problem. These days Pakistan was facing a serious electricity failure. Because of this reason, the schedule for treatment was changed numerous times. The school administration allotted 2 hours daily, 1 hour for Experimental Group 1 and 1 hour for Experimental Group 2 per each session. Due to the frequent power shortfall, the majority of the people and institutions use alternative source of electricity. Although, in that school, an Uninterruptible Power Supply (UPS) with two batteries was also kept there in computer lab. But the batteries were shifted elsewhere in the school premises by the school administration. At the time of data collection, the alternative power resource of the school (UPS was not in working position because in the absence of batteries, it could not be recharged. That is why, before leaving for school, the researcher had to ask about the electricity supply. Due to the

electricity shortfall, the timetable was changed several times. Once, there was no electricity supply for two consecutive days because of raining, upon this, the researcher had to take her home UPS to computer lab for continuation of the treatment plan.

5.4.8 Behavior of the Participants

All the participants of Experimental Group 1 and Experimental Group 2 were taught 44 IPA segmental features vowel and consonant sounds. When the researcher played first video, all the participants of Experimental Group 1 were unable to understand the instructions completely. So, it was another major issue, because they never heard a native speaker in the class for learning something especially pronunciation learning, they were much worried. The researcher realized their problem and next day she brought a multimedia and her own laptop. Then, video No 1 was played to show video collectively all the learners all-together before the whole class. When the native instructor spoke a sentence, the researcher paused the video, asked the learners, "What was lady instructor saying"? Next, she explained that sentence in simple words mixing both the native (Urdu) and second language (English) to make them more understandable. After doing some practice in this way, finally, the majority of the participants were able to capture the instructions easily. Then, the participants of Experimental Group1 were asked to sit on the computer in pair form because there were not enough computers according the numbers of the participants. Therefore, they performed their practices in pair form.

In the computer lab, Experimental Group 1 listened the videos of IPA phonemic chart of vowel and consonant sounds. They were asked by the researcher to do practice

repeatedly. So that they might be able to differentiate the different sounds of vowels. All the participants did practice very enthusiastically except one or two learners. They were reminded to do their work many times in the first session. It seemed that they were feeling boredom and they were not interested at all. Whenever, they were given reminder by the researcher, they paid their full attention. There was constant reminder by the researcher for such type of low motivated participants.

This issue might be aroused because they were doing practice in pairs. They started talking each other and making little noise frequently during their practice despite the presence of their teacher who was appointed to maintain the discipline inside the computer lab. Similarly, a slight noise was also observed by Experimental Group 2. However, their discipline teacher had a good control all over the learners and they attended lecture rather peacefully.

Overall, all the participants had a positive initial reaction to all the digital material that was shown to them for improving pronunciation. The learners showed a significant improvement in their pronunciation skills. Much time was required to explain the learners some basic procedure of computer and introduction of pronunciation. Remarkably, the prompt services of IT expert were mainly very helpful regarding software and hardware issues, computer programming and processing etc. It saved a lot of time and it made continuation of the activity without any break.

Consequently, in the pretests of both the groups, the majority of the learners were afraid for uttering words, sometimes, they skipped the words which were more problematic for them. Furthermore, their voices were trembling. On the other hand, in the posttests, the

majority of the participants of Experimental Group 1 pronounced the words more confidently and accurately. Their fear and anxiety were not observed in the posttest. However, Experimental Group 2 showed no significant findings regarding improving pronunciation sounds and reducing their stress and anxiety level. Even, at the time of posttest, they were very reluctant and were not initiative despite the fact they were encouraged by the researcher many times.

Furthermore, the researcher used her past experience of being an English teacher at secondary school level (approximately more than 10 years). She could understand the problems of the secondary school learners regarding learning English and as well their proficiency level of their oral ability of English language. They had many hurdles such as lack of exposure, lack of vocabulary, mispronunciation and poor grammar skills; all contributed to their inefficiency in speaking.

5.5 Strength of the Current Study

The second language learners had to face several problems in learning pronunciation because it was a different activity from their routine study. As they were not accustomed to it before initiation of the treatment. The current research showed that the participants were hesitant to pronounce words during practice. The reason behind this was that, there, in Pakistani context pronunciation was totally ignored. Almost, no single institution was delivering such sort of instruction to make the learners well aware of these 44 IPA phonemic sounds. In fact, this kind of training is very essential in second language learning because it is basic and compulsory component of learning a second language.

Even the institutions which are offering language courses like IELTS, TOFL and other spoken courses have no clear-cut plan and standard of teaching pronunciation.

In Pakistani context, the problem is that teachers do not have full command over language and they are also unaware of pronunciation patterns or models. Nadeem et al. (2012) observe that English language teacher has to tackle many problems because of different reasons. In language learning process, the problem in pronunciation is consistently adhering to the entire academic career and preoccupied them in their practical life. Therefore, this study is an attempt while launching a CALL/CAPT program to highlight the importance of pronunciation teaching with combination of computer technology. Teachers as well learners can get awareness of basic features of pronunciation through computer and improve their impaired communicative competence.

As Jenkins (2009) also stresses that for teaching pronunciation all the teachers whether they are native or nonnative should have basic knowledge of sounds and articulatory system. He/she should be aware of rules of pronunciation such as how and where sounds and stress are produced, the rules of omission when they relate to acceptable and non-acceptable consonant deletion. Throughout the world, pronunciation teaching is considered a low value phenomenon but despite of the stated fact, non-native teachers are well versed in all these areas and have performed better in regard to teaching pronunciation for EIL (Jenkins, 2009).

Language teachers can provide extra help to their learners in probing new resources and they can give better chance to learners in selecting meaningful and right words and

sentences. She further states that psychologists believe that learning should be pleasing or gratifying experience and children learn better when they are provided relaxed and stress-free environment. According to her, in this way, a healthy competition is possible through language games among the learners in English classes by employing modern devices such computer, laptops, mobiles.

Now the teacher's responsibility becomes dual. Not only they have to maintain their own proficiency level according to the global need, they have to cope with their learner's communicative issues including computer-augmented pronunciation. They have to fulfill their learners' needs, wants and desires and develop a pleasurable, enjoyable and learning centered approach. If they use computer to teach pronunciation, they could remove their learners' fear, anxiety, stress and provide them confidence for pronunciation practice at class level. So that normalization of computer technology for language learning could (Bax, 2003) be sustained in modern language learning classrooms. Therefore, the current study was an initiative step toward this facilitation.

5.6 Ethical and Legal Issues

An imperative and unavoidable issue in experimental research that is discussed frequently is biasness of a researcher. As Tayie (2005) focuses that researcher may have an effect on the results of the study in different ways. Researcher can be biased in observation, data collection, mathematical computations and interpretation. In research, this sin whether it is committed deliberately or unintentionally, it favors research's hypotheses and is considered bias. However, in this study the researcher was totally

unbiased and detached because she believed in originality of the results only could be achieved by detachment. Some important steps were taken to minimize the biasness in experimental research. Such as: both groups 1 and 2 were given treatment, equally allocated time for treatment for both groups (23 hours per each group), same material (IPA phonemic sounds), same instructor (researcher herself). In addition to that, the purpose of hiring human raters was also to reduce the biasness. Both raters were not informed about the experimental group 1 and experimental group 2 and their nature of treatment i.e. innovative or traditional. Lastly, employing the 1-9 point likert scale instead of 1-5 point or 1-7 point likert scale, as in 1-9 point liker scale, there is possibility of more accurate findings.

Furthermore, there are the other ethical issues which should be acted upon at any cost for example, confidentiality and participants' protection. Dawson (2007) also notices that a researcher should try his best to make sure the secrecy and privacy of the participants. Sometimes a researcher needs very sensitive and personal information of the participants regarding his research. Therefore, a researcher about the nature of the study should inform participants. The confidentiality includes the secret information related to participants as well as the openness of study to them. There are two types of researches, i.e., covert and overt. In covert research, a researcher does not inform his/her participants about the nature of the study. Participants are used just as apprentice or as tools for the research purpose. Researcher can drive the participants without informing them. However, in the overt research, a researcher introduces himself to the participants and gives some essential information regarding the nature of the research, purpose of the research and tries to make clarification about concerning ambiguities.

Thus, in this research, the participants were told about the purpose of the study. Every necessary detail was discussed with the participants. Some learners asked the researcher the benefits of conducting this research regarding for selecting them as participants. In fact, it was clear that the study focused only on the interests of the researcher not the participants. "Ethics refers to questions of values, that is, of beliefs, judgments' and personal viewpoints" (Hitchcock & Hughes, 1995, p. 44). To some extent it seems definitely unethical but that sort of unethical issues cannot be avoided. Otherwise, a researcher is unable to conduct the research process and it is beyond a researcher's approach to avoid from these issues.

Another unethical aspect was division of the class in to two groups for the experimental study. Some learners were selected for computer lab for the purpose to teach pronunciation to the experiment group 1 through CALL. The rest of the class (Experimental Group 2) was also wanted to go in to the computer lab. The participants of Experimental Group 2 were very anxious to go to the lab. During the research, they frequently asked the researcher when they would go to the computer lab. In spite of that, they were informed in introductory class that they would be taught inside the classroom through traditional method. So, this was also unethical to select one group for innovative class and was taken to the lab while some remained in the class being taught by boring and monotonous routine. The researcher knew this fact that all the learners had equal right to all opportunities but for purpose of the research, some of the learners had to deprive of some of their rights. "Since human beings have certain rights, the researcher must ensure that the rights of the participants in a project are not violated. This requires a

consideration of ethics: distinguishing right from wrong and the proper from the improper" (Tayie 2005, p. 114).

Dawson (2007) concludes that during the research a researcher have to face some embarrassing conditions but the planned preparation and self-awareness will help to cope with these problems. If a researcher finds some sort of embarrassment or anxiety he/she does not need to be worried and to think too much on the negative side. He suggests that a researcher should stop negative thinking but should take the positive side and should think, analyze, learn by his/her mistake and continue on his/her practice. However, in the current study, at the end of the research, the researcher gave all the important information to Experimental Group 2 regarding innovative treatment, i.e., phonetic videos and digital dictionary and all websites references etc. So that, afterwards, they could utilize by their own way if they wanted to improve their pronunciation skill.

5.7 Limitations of the Study

Although, the current study has presented an insightful knowledge towards effectiveness of computer technology to improve English language pronunciation. On the other hand, as everything has its limitations, this study is not exceptional one. The current research has some limitations as discussed in the following:

Firstly, the current research was conducted only on the secondary school learners. All participants were girls, no single boy was included in this research because of some cultural and religious bondage. It was very difficult to do combine study at senior school level particularly in Pakistani context. Both the boys and girls are taught in separate

school systems especially in government school system. Government schools could be either boys school or girls school. However, at junior level such as primary level girls and boys are taught in the same schools. That is why; the results might be different if both the girls and boys were included in the research. Secondly, the researcher selected a semi-urban area. The learners of big city have better English proficiency level as compared to the learners of small villages. That is why, it could be said that there would also be possibility of different findings if a big city or small town was selected for the current research. Lastly, the researcher conducted a restricted research for short period of time only for 6 weeks, if learners were taught for prolonged period of time with less constrains of time and duration, the results might be more better in enhancing pronunciation sounds via computer device.

5.8 Recommendations for Future Research

It was a pioneered research performed in Pakistani context in regard to improving segmental features of pronunciation through computer technology. The use of computer could also be done in language classroom to improve other language skills such as reading, writing, listening, vocabulary, grammar and suprasegmental features of pronunciation etc. Furthermore, the researcher used only phonetic videos and digital dictionary, however, large amount of CALL online material is available, which could be supplied in language learning classrooms to get better outcomes. As different pronunciation software can help learner a lot in improving their impaired skills.

The current research was conducted on quantitative paradigm, future researchers could be performed qualitatively. Qualitative data can provide in depth insight to probe more issues about pronunciation. This study focused on the segmental features, the future researches can highlight the importance of the suprasegmental features of pronunciation in Pakistani context. There is a dire need of conducting studies on pronunciation issues, as it has always been ignored. However, now it is the need of hour to overcome this chronic disease, by diagnosing the underlying problems and make possibility of its accurate solutions in second language learning. Furthermore, to cope with the demands of this modern world, the importance of technology cannot be denied. It is expected that there would be a time when usage of computer must be retained in the most of educational settings especially the utilization of computer in second language learning, would be more compulsory, and finally, the notion of normalization (Bax, 2003) of computer technology would be possible in near future.

Some suggestions are discussed in the following:

1. An integrated approach, in which four language skills i.e. reading, writing, listening and speaking must be given equally importance in second language learning procedure.
2. Segmental and suprasegmental features, both must be focused. Teachers ought to have fundamental and up to date knowledge of pronunciation and pedagogical implications as well as s/he must also be aware of all challenges regarding arising issues of computer technology.

3. Native models of pronunciation must be utilized and this is not very expensive device. For this purpose, other technological tool such as laptops, (now very handy laptops are available), mobiles for showing movie clips, phonetic videos and some other pronunciation software. Installation would be done only once and then that stalk could be used numerous times for several purposes.
4. Easy access to the digital dictionaries and pronunciation software must also be maintained to provide prompt feedback for the learners' wrongly pronounced words at exact time.
5. Since, Pakistani society is an exam-oriented society, nothing would be improved if there were no exams for a particular skill. Therefore, oral exams must be conducted by government, stake holders, administrators, and teachers inside the class on weekly bases, or monthly bases with scoring (just 2-3 minutes per each student) to identify proficiency level of the learners or even because of shortage of time schedule, oral exams could be performed thrice a year. In this way, learners would be prepared for spoken skill and their pronunciation would also be improved.
6. Teacher training programs must be launched by the government regarding computer technology and also there is need to develop a special awareness for teaching pronunciation.
7. The gap between computer lab and language teaching should be bridged. As computer lab is specified with the mathematics and science subjects, language teachers never use computer lab for second language and especially for pronunciation teaching.

8. Different pronunciation games could be utilized for second language pronunciation teaching and learning. Games can motivate learners and a sense of freedom and enjoyment would be developed among the learners. They would learn the pronunciation in a joyful environment rather than in a sensation of dull, boring and monotonous learning atmosphere.
9. The rule of 'less time more progress' must be kept in the mind by the teachers, which is possible just by normalization of technology.

5.9 Conclusion

The current study was an attempt to investigate the effect of CALL on pronunciation of English language learners in Pakistani context. Although, the learners are indulged in learning English for years, yet Pakistani learners have to face lot of pronunciation problems, such as hesitation, lack of confidence, mispronunciation. They also feel stress and anxiety if they try to speak English because they do not have native exposure and also teachers are not well-trained in this field (Bashiruddin & Qayyum, 2014; Howlader, 2011). As pronunciation is very important aspect of English language it should be given first priority in second language learning process because language is primarily a means of communication and it must be understood by a listener. If someone neglects pronunciation aspect of language then might be he/she has to face a lot of problems to communicate with target audience. Computer technology gives solutions towards the speech impaired learners and provides them a stress free, relaxed and enjoyable settings, through which they can do practice without exhausting their teachers without time constraints, with prompt feedback and can get better outcomes. Therefore, it could be

conferred that the computer-augmented instructions can be proved as milestones regarding pronunciation teaching. The boring task of tedious pronunciation learning could be transformed into more enjoyable and pleasurable activity through using computer technology with improved results.

References

Aamer, M. (2009). Existing Education System of Pakistan Psycho - social and Socio-economic Effects. *NDU Journal* 13-31.

Abshire, S. A. (2006). *Exploring implicit versus explicit methods of teaching phonemic awareness instruction to kindergarten students* (Unpublished doctoral thesis). Louisiana: Louisiana State University and Agricultural and Mechanical College.

AbuSeileek, A. F. (2007). Computer-assisted pronunciation instruction as an effective means for teaching stress. *JALT CALL Journal, 3*(1-2), 3-14.

Ahmad, G., Barki, J. I., & Yasin, M. (2015). Urdu EFL Students Pronunciation, Awareness, and Instruction in Pakistan. *Journal of Policy Research (JPR), 1*(3), 124-130.

Ahmad, N., Khan, F. N., & Munir, N. (2013). Factors affecting the learning of English at secondary school level in Khyber Pakhtunkhwa, Pakistan. *International journal of English language and Literature studies, 2*(2), 95-101.

Ahmed, S., & Rao, C. (2012). Inconsistencies in english language teaching in Pakistan: A comaprison between Public and Private institutions. *European journal of Business and Management, 4*, 15-95.

Ahmed, Z. A. D. A. (2017). Difficulties Encountered by EFL Students in Learning Pronunciation: A Case Study of Sudanese Higher Secondary Schools. *International Journal of English Linguistics, 7*(4), 75.

Akram, M., & Mahmood, A. (2007). THE STATUS AND TEACHING OF ENGLISH IN PAKISTAN. *Language in India, 7*(12).

Akram, M., & Qureshi, A. H. (2012). Problems in learning and teaching English pronunciation in Pakistan. *International Journal of Research in Linguistics and Lexicography, 1*(4), 43-48.

Akram, M., & Qureshi, A. H. (2014). The Role of Features of Connected Speech in Teaching English Pronunciation. *International Journal of English and Education, 3*(3), 230-240.

Algethami, G. Ingram, J., & Nguyen, T. (2011). The interlanguage speech intelligibility benefit: The case of Arabicaccented English. In. J. Levis & K. LeVelle (Eds.). *Proceedings of the 2nd Pronunciation in Second Language Learning and Teaching Conference, Sept. 2010*. (pp. 30-42), Ames, IA: Iowa State University.

Algethami, G., Ingram, J., & Nguyen, T. (2010, September). The interlanguage speech intelligibility benefit: The case of Arabic-accented English. In *Proceedings of the 2nd Pronunciation in Second Language Learning and Teaching Conference*, 30-42.

Alipanahi, F. (2014). Technology and English language pronounciation. *Indian Journal of Fundamental and Applied Life Sciences, 4*(3), 461-465.

Almekhlafi, A.G. (2006). The effect of computer assisted language learning (CALL) on United Arab Emirates English as a foreign language (EFL) school students achievement and attitude. *Journal of Interactive Learning Research, 17*(2), 121-142.

Al-Zaidiyeen, N. J., Mei, L. L., & Fook, F. S. (2010). Teachers' attitudes and levels of technology use in classrooms: The case of Jordan schools. *International education studies, 3*(2), 211.

Anderson-Hsieh, J. (1992). Usiing electronic visual feedback to teach suprasegmental. *System, 20*(1), 51-62.

Aparasu, R., & Bentley, J. P. (2014). *Principles of research design and drug Literature evaluation.* Burlington: Jones & Bartlett Publishers.

Anderson, S. E., & Maninger, R. M. (2007). Preservice teachers' abilities, beliefs, and intentions regarding technology integration. *Journal of Educational Computing Research, 37*(2), 151-172.

Aqel, I. M. (2013). The effect of using Grammar Translation Method on acquiring English as a foreign language. *International Journal of Asian Social Science, 3*(12), 2469-2476.

Awan, A.G., Ayoub, M.T and Bashir, S. (2016). Identification of the Problems of Saraiki Speakers of English Vowels at Secondary level. *Journal of Literature, Language and Linguistics. (25),* 35-44.

Bablekou, Z. (2009). Cognitive Models of Working Memory. In Mourlas, C. (Ed.). *Cognitive and Emotional Processes in Web-Based Education: Integrating Human Factors and Personalization*. London: IGI Global.

Baker, A., & Murphy, J. (2011). Knowledge base of pronunciation teaching: Staking out the territory. *TESL Canada Journal, 28*(2), 29-50.

Bardakçi, M. (2015). Turkish EFL pre-service teachers' pronunciation problems. *Academic Journals: Educational Research and Review. Vol. 10*(16), 2370-2378.

Bashiruddin, A., & Qayyum, R. (2014). Teachers of English in Pakistan : Profile and recommendations. *NUML Journal of Critical Inquiry, 12*(1), 1-19.

Bauer, J., & Kenton, J. (2005). Toward technology integration in the schools: Why it isn't happening. *Journal of technology and teacher education, 13*(4), 519-546.

Bauer, L. (2002). *An Introduction to international varieties of English.* Edinburgh: Edinburgh University Press.

Bax, S. (2003). CALL-past, present and future. *System 3*1, 13-28. Elsevier Science Ltd.

Beatty, C. F. (2016). *Community oral health practice for the dental hygienist.* Missouri: Elsevier.

Beatty, K. (2010). *Teaching and researching computer-assisted language learning*. (2nd ed). England: Pearson.

Beatty, K. (2013). *Teaching & researching: Computer-assisted language learning*. Routledge.

Beinhoff, B. (2014). Perceiving intelligibility and accentedness in non-native speech: A look at proficiency levels. *Concordia Working Papers in Applied Linguistics, 5*, 58-72.

Myles, F. (2013). *Theoretical approaches. The editors Julia Herschensohn and Martha Young-Scholten. The Cambridge handbook of second language acquisition.* New York: Cambridge University Press.

Benzies, Y.J.C. (2013). Spanish EFL University Students' Views on the Teaching of Pronunciation: A survey-based study. Language Studies *Working Papers. 5*(41), 41-49.

Bergin, C. C., & Bergin, D. A. (2015). *Child and adolescent development in your classroom (2nd ed.)*. Stamford: Cengage Learning

Bergström, H. (2007). *Evaluation of a computer assisted language learning system for Swedish language learners*: Numerisk analys och datalogi, Kungliga Tekniska högskolan.

Bhalla, J. (2013). Computer use by school teachers in teaching-learning process. *Journal of Education and Training Studies, 1*(2), 174-185.

Bilal, H. A., Rehman, A., Rashid, A., Adnan, R., & Abbas, M. (2013). Problems in Speaking English with L2 Learners of Rural Area Schools of Pakistan. *Language in India, 13*(10), 1220-1235.

Bilidi, S. (2017) *Collaborative Learner Autonomy: A mode of Learner Autonomy Development*. Singapore: Springe.

Bogdan, R., & Biklen, S. K. (2007). *Qualitative research for education*. Boston; MA: Allyn & Bacon.

Bott, A.-M. K. (2005). *Computer-aided self-access pronunciation materials designed to teach stress in American English.* (Master Dissertation) Department of Linguistics and English Language Brigham Young University.

Breitkreutz, J., Derwing, T. M., & Rossiter, M. J. (2001). Pronunciation teaching practices in Canada. *TESL Canada Journal, 19*(1), 51-61.

Broughton, G., Brumfit, C., Pincas, A., & Wilde, R. D. (2002). *Teaching English as a foreign language*: Routledge.

Berg, L. B. (2001). *Qualitative research methods for the social sciences*. Allyn & Bacon.

Brown, H. D. (2000). *Principles of language learning and teaching*.

Brown, L.D. (2000). *Teaching by Principles: An Interactive Approach to Language Pedagogy* (2nd ed). Longman.

Burns, A., & Claire, S. (2003). *Clearly speaking: pronunciation in action for teachers*. AMEP Research Center. Sydney: National Centre for English Language Teaching and Research.

Busà, M. G. (2008). New perspectives in teaching pronunciation.

http://www.openstarts.units.it/dspace/bitstream/10077/2850/1/bus%C3%A0.pdf on

September, 2015.

Cambridge advanced learner‟s dictionary. (2003). (Version 1.0) [Computer software].

Celce-Murcia, M., Brinton, D. M., & Goodwin, J. M. (2006). *Teaching pronunciation: A reference for teachers of English to speakers of other languages*. Cambridge University Press.

Ceylan, N. O. (2015). GlobELT: An Introduction Conference on Teaching and Learning

Benjamens Publishing Compan *Behavioral Sciences*, 199, 85-93.

Chambers, A., Conacher, J. E. and Littlemore, J. (2004). *ICT and language learning: integrating pedagogy and practice.* The University of Birmingham: University Press.

Chandio, J. H., Ather Khan, H. M., & Samiullah, M. (2013). Condition of Creative Writing in the North and South Punjab. *Pakistan Journal of Commerce & Social Sciences, 7*(2).

Chaplle, C. A. (2001). *Computer Application in Second Language Acquisition*. Foundation for teaching testing and research. Cambridge: Cambridge University Press.

Chapelle, C.A. (2003). *English Language Learning and Technology.* North America John: Benjamine Publishing Company.

Chatterjee, P., & Jain, G. (2011). *Contemporary communicative English for technical communication*. New Delhi: Pearson Education India.

Chen, H. C. (2016). In-service Teachers' Intelligibility and Pronunciation Adjustment Strategies in English Language Classrooms. *English Language Teaching*, *9*(4), 30.

Chien, Y. C. (2011). *Effects of computer-assisted language learning (CALL) instruction on the acquisition of passive grammatical forms by post-secondary English as a*

Second Language (ESL) students. Doctoral dissertation, University of Central Florida Orlando, Florida.

Chilisa, B., & Preece, J. (2005). *Research methods for adult educators in Africa*. Pearson South Africa.

Chun, D.M. (1998). Signal analysis software for teaching discourse intonation. *Language Learning and Technology, 2*(1), 61–77.

Claire, S. (1993). *Pronunciation in the NSW Adult Migrant English Service: Current Practice, Future Directions* (Doctoral dissertation, University of Technology, Sydney).

Cohen, L, Manion, L & Morrison, K. (2007). *Research Methods in Education.* (6th edition). New York: Taylor & Francis Group.

Coleman, H. (2010). Teaching and learning in Pakistan: The role of language in education. Islamabad: The British Council.

Collins, B. S., & Mees, I. M. (2013). *Practical phonetics and phonology: A resource book for students*. Routledge.

Cook, V. (1999). Going beyond the native speaker in language teaching. *TESOL quarterly, 33*(2), 185-209.

Cornu, B. (1995). New Technologies: Integration into education in: Watson, D. and Tinsley, D.(Eds) *Integrating Information Technology into Education.* London: Chapman and Hall.

Costanzo, L. A., & MacKay, R. B. (2009). *Handbook of research on strategy and foresight.* Northampton: Edward Elgar Publishing.

Costanzo, L. A., & MacKay, R. B. (2009). *Handbook of research on strategy and foresight.* Northampton: Edward Elgar Publishing.

Côté, J. (2014). *Youth studies: Fundamental issues and debates.* New York: Palgrave Macmillan.

Creswell, J. W. (2014*). Research Design: Qualitative, Quantitative and Mixed Methods Approaches. London:* SAGE Publications. Inc.

Crewell, J.W. (2012). *Educational Research: Planning, conducting and evaluating quantitative and qualitative Research* (5th Ed). New York: Pearson. Education.

Cunningham, A. E. (1990). Explicit versus implicit instruction in phonemic awareness. *Journal of experimental child psychology, 50*(3), 429-444.

Dan, C. (2006). How can I improve my student's pronunciation? *Report submitted to China's Experimental Centre for Educational Action Research in Foreign Languages Teaching*.

Davies, G. (2005). Computer Assisted Language Learning: Where are we now and where are we going. In *Keynote speech at the University of Ulster Centre for Research in Applied Languages UCALL conference:''Developing a pedagogy for CALL*, (13-15).

Dawson, C. (2007). *A practical guide to research methods: A user-friendly manual for mastering research techniques and projects*: How To Books.

Dekaney, E. (2003). The effect of computerized versus classroom instruction on the phonetic pronunciation of English. *Journal of Research in Music Education, 51* (3), 206-217.

Demirezen, M. (2010). The causes of the schwa phoneme as a fossilized pronunciation problem for Turks. *Procedia-Social and Behavioral Sciences, 2*(2), 1567-1571.

Derwing, T. M. (2010). *Utopian goals for pronunciation teaching.* Paper presented at the Proceedings of the 1st pronunciation in second language learning and teaching conference.

Derwing, T. M., & Munro, M. J. (1997). Accent, intelligibility, and comprehensibility: Evidence from four L1s. *Studies in second language acquisition, 19*(1), 1-16.

Derwing, T. M., & Munro, M. J. (2005). Second language accent and pronunciation teaching: A research-based approach. *Tesol Quarterly, 39*(3), 379-397.

Derwing, T. M., & Munro, M. J. (2015). Pronunciation fundamentals: Evidence-based perspectives for L2 teaching and research. Amsterdam: John Benjamins. [DOI:10.1075/lllt.42].

Derwing, T., Munro, M., & Carbonaro, M. (2000). Does popular speech recognition

Derwing, T. M., Munro, M. J., & Wiebe, G. (1998). Evidence in favor of a broad framework for pronunciation instruction. *Language learning*, *48*(3), 393-410.

Derwing, T. M., Diepenbroek, L. G., & Foote, J. A. (2012). How well do general-skills ESL textbooks address pronunciation?. *TESL Canada Journal*, *30*(1), 22.

Derwing, T. M., Rossiter, M. J., & Munro, M. J. (2002). Teaching native speakers to listen to foreign-accented speech. *Journal of Multilingual and Multicultural Development, 23*, 245–259.

Dobrovolsky, M., & Katamba, F. (1997). Phonetics: The sounds of language. *Contemporary Linguistics: An Introduction. Addison Wesley Longman Limited, Essex*.

Dornyei, Z. (2007). *Research Methods in Applied Linguistics*: *Quantitative, qualitative and Mixed Methodologies*. USA: Oxford University Press.

Dunkel, P. (1991) The effectiveness research on Computer-Assisted instruction and computer assisted language learning. In Dunkel, P. (ed.), *Computer-Assisted*

Language Learning and Testing: Research Issues and Practice. New York: Newbury House.

Egwuogu, C. (2012). Challenges and Techniques in the Teaching of English Pronunciation in Junior Secondary School in Nigeria. *Asian journal of social sciences & humanities, 1*(4), 212-219.

Ellis, R. (2015). *Understanding Second Language Acquisition: Applied Linguistics (2nd ed.)*. Oxford: Oxford University Press.

Eskenazi, M. (1999). Using a computer in foreign language pronunciation training: What advantages?, 16 *(3) Calico Journal*, 447-469.

Esmail, A., Ahmed, M., & Noreen, S. (2015). Why Do Pakistani Students are Reluctant to Speak English.

Evans, M. (2009). *Foreign language learning with digital technology*: A&C Black.

Farhat, P. A., & Dzakiria, H. (2017). Pronunciation barriers and computer assisted language learning (CALL): Coping the demands of 21st century in second language learning classroom in Pakistan. *International Journal of Research in English Education, 2*(2), 53-62. doi: 10.18869/acadpub.ijree.2.2.53.

Fasold, R. W., & Connor-Linton, J. (2013). *An introduction to language and linguistics.* Cambridge: Cambridge University Press.

Felix, U. (2005). Analysing recent CALL effectiveness research - towards a common agenda. *Computer Assisted Language Learning, 18* (1), 1-32.

Flowerdew, J., & Miller, L. (2005). *Second language listening: Theory and practice.*New York: Cambridge University Press.

Fraser, H. (2000). *Phonetics, phonology, and the teaching of pronunciation-a new cd-rom for all esl learners and its rationale.* Paper presented at the Eighth Australian International Conference on Speech Science and Technology.

Fraser, H., & Perth, H. F. (1999). ESL pronunciation teaching: Could it be more effective. *Australian Language Matters, 7*(4), 7-8.

Fraser, H., Department of Education, T., & Affairs, Y. (2001). *Teaching pronunciation: A handbook for teachers and trainers. Three frameworks for an integrated approach*: New South Wales.

Frawley, W. (1997). *Vygotsky and cognitive science*. Cambridge, MA: Harvard University Press.

Gall, M. D, Gall, J. P. & Borg, W.R. (2003*). Educational Research: An Introduction*. (7th ed). Boston: Pearson Education. Inc.

Gambari, A. I., Kutigi, A. U., & Fagbemi, P. O. (2014). Effectiveness of Computer-Assisted Pronunciation Teaching and Verbal Ability on the Achievement of

Senior Secondary School Students in Oral English. *GiST Education and Learning Research Journal, 8*, 11-28.

Gay, L. R. (1996). *Educational research (5th ed.).* Islamabad: National Book Foundation.

Gay, L. R., Mills, G. E., & Peter Airasian, P. (2012) *Educational research (10th ed.).* New York: Pearson.

Geeslin, K. L., & Long, A. Y. (2014). Sociolinguistics and second language acquisition: Learning to Use Language in Context. New York: Routledge.

Ghulamullah and Hamzah, M. H. (2017). English language segmental awareness of Pakistani elementary English teachers. *International journal of language, Literature and translation studies 4*(2), 488-495.

Gilakjani, A. P. (2012). A study of factors affecting EFL learners' English pronunciation learning and the strategies for instruction. *International Journal of Humanities and Social Science, 2*(3), 119-128.

Gilakjani, A. P., & Ahmadi, M. R. (2011). Why Is Pronunciation So Difficult to Learn? *English Language Teaching, 4*(3), 74-83.

Gilbert, J. B. (2008). *Teaching pronunciation: Using the prosody pyramid*: Cambridge University Press.

Gilbert, J. B. (2010). Pronunciation as orphan: What can be done. *Speak Out, 43*, 3-7.

Gilner, L. (2008). Pronunciation: A review of methods and techniques. *Journal of the School of Foreign Languages, Nagoya University of Foreign Studies,* 35, 93-108.

Gorard, S. (2001). *Quantitative methods in educational research: The role of numbers made easy*: Bloomsbury Publishing.

Gordon, J., Darcy, I., & Ewert, D. (2012, August). Pronunciation teaching and learning: Effects of explicit phonetic instruction in the L2 classroom. In *Proceedings of the 4th Pronunciation in Second Language Learning and Teaching Conference* (pp. 194-206).

Gorjian, B., Hayati, A., & Pourkhoni, P. (2013). Using Praat software in teaching prosodic features to EFL learners. *Procedia-Social and Behavioral Sciences, 84*, 34-40.

Gould, J. E. (2001).*Concise handbook of experimental methods for the behavioral and biological sciences.* New York: CRC Press.

Gulbahar, Y. (2007). Technology planning: A Roadmap to successful technology integration in schools. *Computers and Education, 49* (4), 943-956.

Gündüz, N. (2005). Computer assisted language learning. *Journal of Language and Linguistic Studies, 1*(2).

Gut, U. (2009). *Introduction to English phonetics and phonology*. New York: Peter Lang.

Habib, R. B. (2012). *English Pronunciation in Policy and Practice at College Level in Bangladesh.* East West University.

http://dspace.ewubd.edu/bitstream/handle/123456789/662/Rabeya_Binte_Habib.pdf?sequence%20on%20March,%2010,%202015.

Hahn, L. & Watts, P. (2011). (Un)Intelligibility Tales. In. J. Levis & K. LeVelle (Eds.). Proceedings of the 2nd Pronunciation in Second Language Learning and Teaching Conference, Sept. 2010. (pp. 17-29), Ames, IA: Iowa State University.

Haider, G. (2013). Perceptions of ESL Teachers towards CALL: Implications for ELT (English Language Teaching) at the Intermediate Level-A Case Study from Pakistan. *Language in India, 13*(8), 204-238.

Harding, L. (2012). Accent, listening assessment and the potential for a shared-L1 advantage: A DIF perspective. *Language Testing, 29*(2), 163-180.

Hardison, D. M. (2004). Generalization of computer-assisted prosody training: Quantitative and qualitative findings. Language Learning and Technology, 8(1), 34–52. http://dx.doi.org/10125/25228.

Harmer, J. (2001). The practice of English language teaching. *London/New York*.

Harper, A. G. (2004). CALL based pronunciation exercises and their effectiveness for beginning ESL learners. *Proceedings of CLaSIC 2004*, 948-953.

Hashmi, F. A. (2012). Omission of schwa in Pakistani English. *Elixir International Journal. Linguistics 44C*, 7093-7101.

Hassan, E. M. I. (2014). Pronunciation Problems: A case study of English language students at Sudan University of Science and Technology. *English Language and Literature Studies4* (4), 31-44.

Hayati, A. M. (2010). Notes on teaching English pronunciation to EFL learners: a case of Iranian high school students. *English language teaching, 3*(4), 121-126.

Hayward, K. (2013). *Experimental phonetics.* New York: Routledge Taylor and Francis Group.Health Sciences.

Hewings, M. (2004). *Pronunciation practice activities: A resource book for teaching English pronunciation*: Ernst Klett Sprachen.

Hietanen, H. (2012). Teaching the pronunciation of English as an international language: suggestions for constructing a syllabus for Finnish learners.

Hincks, R. (2003). Speech technologies for pronunciation feedback and evaluation. *ReCALL, 15*(1), 3-20.

Hinkel, E. (2006). Current perspectives on teaching the four skills. *Tesol Quarterly, 40*(1), 109-131.

Hirata, Y. (2004). Computer assisted pronunciation training for native English speakers learning Japanese pitch and durational contrasts. *Computer Assisted Language Learning, 17*(3), 357–376.

Hismanoglu, M., & Hismanoglu, S. (2011). Internet-based pronunciation teaching: An innovative route toward rehabilitating Turkish EFL learners' articulation problems. *European Journal of Educational Studies, 3*(1), 23-36.

Hişmanoğlu, M. (2005). Teaching English through Literature. *Journal of language and linguistic studies, 1*(1), 53-66.

Hitchcock, G., & Hughes, D. (1995). *Research and the teacher: A qualitative introduction to school-based research*: Psychology Press.

Howlader, M. R. (2010). ASA university review, teaching English pronunciation in countries where English is a second language: *Bangladesh Perspective, 4*(2), 233-244.

Howlader, M. R. (2011). Approaches to developing pronunciation in a second language: A study in Bangladesh. *ASA University Review, 5*(2), 273-281.

Howlader, M. R. (2011). ASA university review, teaching English pronunciation in countries where English is a second language: *Bangladesh Perspective, 4*(2), 233-244.

Hua, T. P. (2006). Bridging pedagogy and technology: User evaluation of pronunciation oriented CALL software. *Australasian Journal of Educational Technolog,* 22(3), 375-397.

Hurtado, L. M., & Estrada, C. (2010). Factors influencing the second language acquisition of Spanish vibrants. *The Modern Language Journal, 94*(1), 74-86.

Hussain, S. (2004, August). To-sound conversion for Urdu text-to-speech system. In *Proceedings of the workshop on computational approaches to Arabic script-based languages.* 74-79. Association for Computational Linguistics.

Hutchinson, T., & Waters, A. (1991). *English for specific purposes*: Cambridge University Press.

Huwari, I. F., & Mehawesh, M. (2015). Review of the importance of teaching pronunciation in the Arab society. *International Journal on Studies in English Language and Literature (IJSELL), 3*(6), 31-37.

Jabeen, A. (2013). *English language learning approach: implementing collaborative language learning approach in federal colleges of Pakistan*. Islamabad: National University of Modern Languages Islamabad.

Molenda, M., & Januszewski, A. (2008). Educational technology: A definition with commentary. *Mahwah, NY: Erlbaum*.

Javed, M., & Ahmad, A. (2014). Assessing ESL students' pronunciation in the Pakistani context. *Journal of Language and Linguistic Studies*, *10*(1), 19-30.

Jenkins, J. (1998). Which pronunciation norms and models for English as an International Language? *ELT journal*, *52*(2), 119-126.

Jenkins, J. (2001). *The Phonology of ELnglish as an International Language*. New York, Oxford University Press.

Jenkins, J. (2002). A Sociolingualitically based, empirically researched pronunciation syllabus for English as an international language. Applied Linguistics (23) 1,83-103.

Jenkins, J. (2004). Research in teaching pronunciation and intonation. *Annual review of applied linguistics*, *24*, 109-125.

Jenkins, J. (2009). English as a lingua franca: Interpretations and attitudes. *World Englishes*, *28*(2), 200-207.

Jenkins, J., & Seidlhofer, B. (2001). Bringing Europe's lingua franca into the classroom. *Guardian Weekly*, *19*.

Johnson, B., & Christensen, L. (2013). *Educational research: Quantitative, qualitative, and mixed approaches*. Sage.

Johnston, B. (2003) *Values in English language teaching*. London; Lawrence Erlbaum Associates, Inc. retrieved from http://www.mssu.edu/projectsouthasia/history/primarydocs/education/Macaulay001.htm on December 20, 2014.

Judson, E. (2006). How teachers integrate technology and their beliefs about learning: Is there a connection? *Journal of Technology and Teacher Education,* 14 (3), 581-597.

Kachru, Y. (2003). Hindi-Urdu. In B. Comrie (Ed.).*The Major Languages of South Asia, The Middle East and Africa.* London: Routledge.

Kahl, D. J. (2008). *Action research: Student voice evaluates high school communication curriculum.* Ann Arbor, Michigan: ProQuest.

Khan, T. (2011, October, 4) English Language Teaching in Pakistan. *The Dawn*. Retrieved from http://www.dawn.com/news/663605/english-language-teaching-inpakistan on 9th June, 2015.

Kamyab, S. (2008). The University Entrance Exam Crisis in Iran. *International Higher Education*, Number 51. retrieved from Retrieved from www.bc.edu/bc_org/avp/soe/ci on November 2, 2012.

Kanire, G. (2012). *Social science research methodology: Concepts, methods and computer applications.* Munich: GRIN Verlag.

Kanoksilapatham, B. (2014). Thai Elementary school teachers' English Pronunciation and effects of teacher variables: Professional development. *The Electronic Journal for English as a Second Language, 18*(1), 1-13.

Kausar, T., Choudhry, B. N., & Gujjar, A. A. (2008). A comparative study to evaluate the effectiveness of computer assisted instruction (cai) versus class room lecture (crl) for computer science at ics level. *TOJET: The Turkish Online Journal of Educational Technology, 7*(4).

Keeves, J. P., & Watanabe, R. (2003). *The international handbook of educational research in the Asia-Pacific region.* London: Springer Science & Business Media.

Kelly, G. (2001). Teaching pronunciation. *How to teach pronunciation. Edinburgh: Longman*, 11-28.

Kelly, L. G. (1976). *25 Centuries of Language Teaching*. USA: Newbury House Publishers.

Kenworthy, J. (1988). *Teaching English pronunciation.* New York: Longman

Keppel, G. (1991). *Design and analysis: A researcher's handbook* (3rd ed.). Englewood Cliffs, NJ: Prentice Hall.

Kesavan V. E. Nirmala J.R (2011). *Breaking language teachers' barrier to use call programme.*V.E1. Department of English, Sri Muthukumaran Institute of Technology, Chennai, India.

Khalique, H. (2006, July). The Urdu–English relationship and its impact on Pakistan's social development. In *Workshop titled Between state ideology and popular culture: Urdu literature and Urdu media in contemporary Pakistan, Held in Heidelberg, Germany* (pp. 20-22).

Khan, a. Q., & Qadir , T. K. (2012). English pronunciation problems for Pahari learners: An acoustic study. *International J. Soc. Sci. & Education, 2*(2), 37-47.

Khurana, A. (2009). *Scientific management: A management idea to reach a mass audience*. New Delhi: Global India Publications

Kim, A. Y. (2012). Investigating the effectiveness of computer-assisted language learning (CALL) in improving pronunciation: A case study. *Multimedia-Assisted Language Learning, 15*(3), 11-33.

Kiyani S. (2012). *English 10. Punjab Chief Minister's Programme for Education Reforms*. The Caravan Book House , Karachi Road, Lahore.

Knight, R. A. (2013). *Phonetics: A course book*. New York: Cambridge University Press.

Knowles, L. (2004). The evolution of CALL. *Language Magazine, 3*(12), 20-23.

Koike, Y. (2014). Explicit pronunciation instruction: Teaching suprasegmental to Japanese learners of English. In N. Sonda & A. Krause (Eds.), *JALT 2013 Conference Proceedings*. Tokyo: JALT.

Kothari, C. R. (2004). *Research methodology: Methods and techniques*: New Age International.

Kumar, C. P. (2013). The eclectic method-theory and its application to the learning of English. *International Journal of Scientific and Research Publications, 3*(6).

Kumar, E.S. and Madhavi, K.V. (2012). The Teaching of Articulation Skills in English using Computer-Assisted Language Learning (CALL) in Engineering colleges of Andhra Pradesh. *International Journal of Business Economics & Management Research.* 2, 4. 218-226.

Kumar, R. (2011). *Research Methodology* (ed.) India: Sage.

Laghos, A., & Zaphiris, P. (2009). Computer-Aided Language Learning. In Rogers, P. L., Berg, G. A., Boettcher, J. V., Howard, C., Justice, L., & Schenk, K. D. (Eds.), Encyclopedia of Distance Learning, SecondEdition. 374-376.

Lambacher, S. (1999). A CALL tool for improving second language acquisition of English consonants by Japanese learners. *Computer Assisted Language Learning, 12*(2), 137-156.

Ladefoged, P & Johnson, K. (2011). *A course in Phonetics*. (6th Ed). Boston: Wadsworth

Cengage Learning.

Lantolf, J. P., & Appel, G. (Eds.). (1994). *Vygotskian approaches to second language research*. Greenwood Publishing Group.

Lodico, M. G., Spaulding, D. T., & Voegtle, K. H. (2010). *Methods in educational research: From theory to practice* (Vol. 28): John Wiley & Sons.

Laroy, C. (1995). *Pronunciation*. Oxford: Oxford University Press

Lee, K.-w. (2000). English teachers' barriers to the use of computer-assisted language learning. *the internet TESL Journal, 6*(12), 1-8.

Lee, S. T. (2008). Teaching pronunciation of English using computer assisted learning software: An action research study in an institute of technology in Taiwan.

Levis, J. (2007). Computer technology in teaching and researching pronunciation. *Annual review of applied linguistics, 27*, 184-202.

Levis, J. M. (2006). Pronunciation and assessment of spoken language. In R. Hughes (Ed.).*Spoken English, TESOL and applied linguistics* (pp. 245-270). New York: Palgrave Macmillan.

Levis, J. M., & Grant, L. (2003). Integrating pronunciation into ESL/EFL classrooms. *Tesol Journal, 12*(2), 13-19.

Levis, J., & LeVelle, K. (2010). *Rebuilding a professional space for pronunciation.* Paper presented at the Proceedings of the 1st Pronunciation in Second Language Learning and Teaching Conference.

Levy, M. (1997). *Computer-assisted language learning: Context and conceptualization*: Oxford University Press.

Levy, M., Blin, F., Siskin, C. B., & Takeuchi, O. (2011). *WorldCALL: International perspectives on computer-assisted language learning*: Routledge.

Lima, E. F. (2010). Language and Non-language factors affecting nonnative undergraduate students' reaction to ITAS. Pronunciation and Intelligibility: Issues in Research and Practice. 43.

Lin, L. C. (2014). Understanding pronunciation variations facing ESL students. *International Journal of Humanities and Social Science, 5*(1), 4.

Lloyd, P., & Fernyhough, C. (1999). *Lev Vygotsky: critical assessments* (Vol. 2). New York: Taylor & Francis

Little D. (1999). *Learner Autonomy 1: Definitions, Issues and Problems* .Dublin: Authentik Language Learning Resources.

Liu, M., Moore, Z., Graham, L., & Lee, S. (2002). A look at the research on computer-based technology use in second language learning: Review of literature from 1990-2000. *Journal of Research on Technology in Education,* 1-54.

Liu, S. C., & Hung, P. Y. (2016). Teaching Pronunciation with Computer Assisted Pronunciation Instruction in a Technological University. *Universal Journal of Educational Research, 4*(9), 1939-1943.

Lodge, K. (2009). A *critical introduction to phonology.* New York: Continuum International
Publishing Group

Luchini, P. L. (2005). A new approach to teaching pronunciation: An exploratory case study. *The Journal of AsiaTEFL, 2*(2), 35-62.

Macdonald, S. (2002). Pronunciation views and practices of reluctant teachers. *Prospect.17*(3), 3-18.

Mahmood, A., & Ghani, M. (2012). Communicative skills of student teachers in Pakistan. *International Journal of Research in Linguistics and Lexicography, 1*(3), 33-50.

Malghani, F., & Bano, S. (2014). Influence of L1 on acquisition of English (L2) stress pattern. *Balochistan Journal of Linguistics, 2*, 64-78.

Mather, N., Wendling, B. J., & Roberts, R. (2009). *Writing assessment and instruction for students with learning disabilities (2nd ed.).* San Francisco: John Wiley & Sons.

Mahmood, A. & Ghani, M. (2012). Communication Skills of Students Teachers in Pakistan. International Journal of Research in Linguistics and Lexicography. 1 (3), 33-50.

Majoka, M. I., Khan, M. J., & Khan, M. I. (2016). Pronunciation teaching: The missing link in English teaching in Pakistani schools. *Journal of Elementary Education, 26*(1), 1-16.

Mansoor, S. (2004). The medium of instruction dilemma: Implications for language planning in higher education. *Language Policy, Planning, & Practice: A South Asian Perspective. Karachi: Agha Khan University*.

Mansoor, S. (2004). TEFL in Pakistan: Emerging issues. *The Journal of AsiaTEFL, 1*(1), 349-374.

Mansoor, S. (2005). *Language planning in higher education.* Karachi: Oxford University Press.

Marçalo, M. J., Fonseca, M. d. C., & Silva, A. A. (2010). ICT in higher education in Portugal. *Call computer assisted language learning.* (crosscheck)

Marsden, E., Mitchell, R., & Myles, F. (2013). (3rd) *Second language learning theories*. Routledge.

McKay, S. (2002). *Teaching English as an international language.* China: Oxford University Press.

McKay, S. L., & McKay, S. (2002). *Teaching English as an international language.* Oxford: Oxford University Press.

McNabb, D. E. (2015). *Research methods for political science: Quantitative and qualitative methods.* New York: Routledge.

Metruk, R. (2017). The Use of Electronic Dictionaries for Pronunciation Practice by University EFL Students. *Teaching English with Technology, 17*(4), 38-51.

Miller,S,F. (2004). *Pronunciation and the adult ESL learner*. University of Pennsylvania.

Mirza, H. S. (2015). ESL and EFL learners improve differently in pronunciation: The case of Lebanon. *Procedia-Social and Behavioral Sciences, 199*, 486-495.

Molenda, M., & Januszewski, A. (2008). Educational technology: A definition with commentary. *Mahwah, NY: Erlbaum*.

Morley, J. (1991). The pronunciation component in teaching English to speakers of other languages. *Tesol Quarterly, 25*(3), 481-520.

Muijs, D. (2004). *Doing Quantitative Research in Education with SPSS*. London: Sage Publication Ltd.

Muir-Herzig R.G. (2004). Technology and its Implication in the classroom. *Computers & Education* 42, 111-131.

Muller, D. A. (2008). *Designing effective multimedia for physics education*: University of Sydney.

Munro, M. J. (2008). Foreign accent and speech intelligibility. In J. G. H. Edwards, M. L. Zampini (Eds.). *Phonology and second Language acquisition* (pp. 193-218). Philadelphia: John.

Munro, M. J., & Derwing, T. M. (1998). The effects of speaking rate on listener evaluations of native and foreign-accented speech. *Language Learning, 48*(2), 159-182.

Murray, J. (1995) Lessons learned from the Athena Language Learning Project: using natural-language processing, graphics, speech processing, and interactive video for communication-based language learning. In Holland, V.M., Kaplan,J.D. and Sams, M.R. (eds), *Intelligent Language Tutors: Theory Shaping Technology*. Mahwah, NJ: Lawrence Erlbaum Associates: 243–56.

Myles, F. (2013). *Theoretical approaches. The editors Julia Herschensohn and Martha Young-Scholten. The Cambridge handbook of second language .acquisition.* New York: Cambridge University Press.

Nadeem, M., Mohsin, M. N., Mohsin, M. S., & Hussain, K. H. (2012). Use of computer assisted language learning in improving pronunciation among prospective teachers. *International Journal of Contemporary Research in Business, 4*(1), 1-8.

Najeeb, S. S. (2013). Learner autonomy in language learning. *Procedia-Social and Behavioral Science*s, 70, 1238-1242.

Nation, I. S. P., & Newton, J. (2009). *Teaching ESL/EFL listening and speaking*. New York: Routledge, Taylor and Francis.

National Curriculum for English Language. Grade I-XII. (2006). Government of Pakistan Mministry of Education Islamabad.

Nawab, A. (2012). Is it the way to teach language the way we teach language? English language teaching in rural Pakistan. *Academic research international, 2*(2), 696.

Nelson, C. L. (1993). Sociocultural parameters of intelligibility. In J. E. Alatis, (Ed.). *Language, Communication, and Social Meaning* (pp. 403-412). Washington: Georgetown University Press.

Neri, A., Cucchiarini, C., & Strik, H. (2002). Feedback in computer assisted pronunciation training: technology push or demand pull?

Neri, A., Cucchiarini, C., Strik, H., & Boves, L. (2002). The pedagogy–technology interface in computer assisted pronunciation training. Computer Assisted Language Learning, 15(5), 441–467.

Neri, A., Mich, C., Gerosa B. & Giuliani, H. (2008). *Feedback in computer-assisted pronunciation training: when technology meets pedagogy.* Proceedings of CALL Conference "CALL Professionalsand the Future of CALL Research", Antwerp, Belgium, 179-188.

Neri, A., Mich, O., Gerosa, M., & Giuliani, D. (2008). The effectiveness of com- puter assisted pronunciation training for foreign language learning by children. Computer Assisted Language Learning, 21, 393-408.

Olson, D. J. (2014). Benefits of visual feedback on segmental production in the L2 classroom. *Languge Learning & Technology*. *18*(3),173-192.

Oxford, R. L. (1997). Cooperative learning, collaborative learning, and interaction: Three communicative strands in the language classroom. *The Modern Language Journal, 81*(4), 443-456.

Pawlk, M. (2011). *Students' success and failure in learning foreign language pronunciation:* Insight from diary data. In Arabski, J, & Wojtaszek, A. (eds) The Acquisition of L2 Phonology. Bristol: Multilingual Matters.

Papachristou, V. (2011). Explicit vs. implicit Pronunciation Teaching to Greek children: the case of the acquisition of English vowels. *Selected papers on theoretical and applied linguistics, 19*, 371-381.

Patil, Z. (2008). Rethinking the objectives of teaching English in Asia. *Asian EFL Journal, 10*(4), 227-240.

Paulson, D. S. (2014). *Topical antimicrobials testing and evaluation (2nd ed.).* New York: CRC Press.

Pawlak, M. (2011). Students' successes and failures in learning foreign language pronunciation: Insights from diary data. *The acquisition of L2 phonology*, 165-182.

Pennington, M. C. (1999). Computer-aided pronunciation pedagogy: Promise, limitations, directions. *Computer Assisted Language Learning, 12*(5), 427-440.

Pennington, M.C. & Stevens, V. (1992). *Computers in Applied Linguistics*. Phonology in English Language Teaching: An introduction approach. New York: Multilingual Matters Ltd.

Phakiti, A. (2015). *Experimental research methods in language learning*: Bloomsbury Publishing.

Por, F. P., & Fong, S. F. (2013). The use of mouth movement video and digitised phonetic symbols on pronunciation learning among learners with different psychological profiles. *International Journal of Academic Research in Business and Social Sciences, 3*(2), 289.

Radford, A., Atikinson, M., Britain, D., Clahsen, H. & Spencer, A., (2009). *Linguistics: An Introduction*. New York: Cambridge University Press.

Rahbar, S, Jahandar, S, Khodabandehlou, M. (2013). *Journal of Applied Environmental and BiologBeaical Sciences.* TextRoad Publication. J. Appl.Environ.Bio.Sci 3(8)112-116, 2013. Department of English Language, Science and Research Branch, Islamic Azad University, Guilan Rasht Iran.

Rahman, T. (2004). *Language policy and localization in Pakistan: Proposal for a paradigmatic shift.* Paper presented at the SCALLA Conference on computational linguistics.

Rahman, T. (2005). *Language policy, identity and religion: Aspects of the civilization of the Muslims of Pakistan and north India*. Islamabad: Quaid-i-Azam University Islamabad.

Rahman, T. (2010). *Language policy, identity and religion: Aspects of the civilization of the Muslims of Pakistan and north India*. Islamabad: Quaid-i-Azam University Islamabad.

Rahman, T. (2014). *Pakistani English.* Islamabad: Quaid-i-Azam University Islamabad.

Rehman, G., Khan, A. Q., & Bukhari, N. H. (2012). English problematic consonants for Pashto

speakers. *Academic Research International, 2*(1), 995-704.

Rasheed, A. K. (2014). *The effect of using authentic materials on the spoken use of English verb tenses for English as a foreign language among Arab secondary school students in Malaysia.* Universiti Utara Malaysia.

Rashid, K., & Mukhtar, S. (2012). Education in Pakistan: Problems and their solutions. *International Journal of Academic Research in Business and Social Sciences, 2*(11), 332.

Rauf, S., & Iqbal, H. M. (2008). Power of linguistic privilege: Critical discourse analysis of the narratives of Pakistani immigrant students in American schools. *Bulletin of Education and Research, 30*(2), 45-60.

Riazi, A. M. (2016). *The Routledge encyclopedia of research methods in applied linguistics.*

Richards, J. C., and Rodgers, T.S. (2001). *Approaches and Methods in language teaching (2nd ed).* New York: Cambridge University Press.

Richards, J. C., & Schmidt, R. (2010). *Longman dictionary of language teaching and applied linguistics.* London: Pearson.

Richards, J. C., Platt, J., & Platt, H. (1992). *Longman dictionary of language teaching and applied linguistics.* Harlow: Longman.

Richey, C. (2003) What is phonology? retrieved from http://www.stanford.edu/~colleenr/ling113/handout1.pdf on October 15, 2015].

Ritchie, W. C., & Bhatia, T. K. (Eds.). (2009). *The new handbook of second language acquisition.* Bingley: Emerald Group of Publishing.

Roach, P. (1998). *English phonetics and phonology. A practical course*. (2nd Ed). Cambridge; Cambridge University Press.

Ruellot, V. (2011). *Computer-assisted pronunciation learning of French/u/and/y/at the intermediate level.* Paper presented at the Proceedings of the 2nd pronunciation in second language learning and teaching conference.

Saito, K. (2007). The Influence of Explicit Phonetic Instruction on Pronunciation in EFL Settings: The Case of English Vowels and Japanese Learners of English. *Linguistics Journal, 2*(3).

Saito, K. (2011). Examining the role of explicit phonetic instruction in native-like and comprehensible pronunciation development: An instructed SLA approach to L2 phonology. *Language Awareness, 20(*1), 45–59.

Saito, K. (2012). Effects of Instruction on L2 Pronunciation Development: A Synthesis of 15 Quasi-Experimental Intervention Studies. *Teachers of English to Speakers of Other Languages, Inc. (TESOL).* 46 *(4),*842-854.

Salkind. N. J. (2010). *Encyclopedia of research design(Vol, 1)*. London: SAGE Publications

Schumann, J. H. (1990). Extending the scope of the acculturation/pidginization model to include cognition. *Tesol Quarterly, 24*(4), 667-684.

Seferoglue, G. (2005). Improving students' pronunciation through accent reduction soft-ware. *British Journal of Educational Technology, 36*(2), 303–316.

Setter, J., & Jenkins, J. (2005). State-of-the-art review article. *Language Teaching, 38*(1), 1-17.

Sewell, A. (2016). *English pronunciation Models in a globalized world: Accent, acceptability and Hong Kong English.* New York: Routledge

Shahzada, G. (2012) Views of the Teachers Regarding the Students' Poor Pronunciation in English Language. *Journal of Educational and Social Research*. 2, 1.

Shamim, F. (2011). English as the language for development in Pakistan: Issues, challenges and possible solutions. *Dreams and realities: Developing countries and the English language*, 291-310.

Shams, A. N. (2006). Use of Computerized Pronunciation Practice in the Reduction of Foreign Language Classroom Anxiety.

Sheikh, Q. A. (2012). An Analysis of the Vowel Sounds of Pakistani English. Bulletin of Education and Research. 34 (1), 1-18.

Sheingold, K. & Hadley, M. (1990). Accomplished teachers: Integrating computers into classroom practice. New York : Bank Street College of Education , Center for Technology in Education. ED 322 900.

Shen, Z. (2013). The effects of vocabulary knowledge and dictionary use on EFL reading performance. *English Language Teaching*, *6*(6), 77.

Shooshtari, Z. G., Mehrabi, K., & Mousavinia, S. R. (2013). A call for teaching pronunciation in Iranian schools. *International Journal of Academic Research in Progressive Education and Development*, *2*(1), 454-465.

Singh, K. (2007). *Quantitative social research methods*. Sage.

Singh, S. K. (2014). 'New Linguistic World Order'and'Alternative Socio-linguistics'. *International Proceedings of Economics Development and Research*, *72*, 10.

Skandera, P., & Burleigh, P. (2005). *A manual of English phonetics and phonology: twelve lessons with an integrated course in phonetic transcription*: Gunter Narr Verlag.

software work with ESL speech? *TESOL Quarterly*, *34*(3), 592–603.

Sreejesh, S., Mohapatra, S., & Anusree, M. R. (2013). *Business research methods: An applied orientation.* London: Springer Science & Business Media.

Stockwell, G. (2007). A review of technology choice for teaching language skills and areas in the CALL literature. *ReCALL, 19* (2), 105-120.

Suharyadi, M. (2011).*The impact of computer assisted language learning (CALL) in language teaching.* Post Graduate Programme of English Language Education. Jakarta:University of Hamka Jakarta.

Syed, N. A., Ansari, S., & Gopang, I. B. (2017). Perception and Production of Consonants of English by Pakistani Speakers. *International Journal of English Linguistics*, *7*(3), 201. *System, 20*, 51-62.

Tahreen, T. (2015). Challenges in teaching pronunciation at tertiary level in Bangladesh. *International Journal of English Language & Translation Studies*, *3*(1), 9-20.

Tanner, M., & Landon, M. (2009). The effects of computer-assisted pronunciation readings on ESL learners' use of pausing, stress, intonation, and overall comprehensibility.

Teuscher, C. (2012). *Turing's connectionism: An investigation of neural network architectures.* London: Springer Science & Business Media.

Tayie, S. (2005). *Research methods and writing research proposals*: Pathways to Higher Education.

Taveeno, A. (2011). Challenges in teaching and learning of English at secondary level class x. *International Journal of Human Resource Studies, 1*(2), 27-35.

Tergujeff, E. (2013). Learner perspective on English pronunciation teaching in an EFL Context. *Research in language, 11*(1), 81-95.

Teuscher, C. (2012). *Turing's connectionism: An investigation of neural network architectures.* London: Springer Science & Business Media.

Thirumalai, M. (2003). Lord Macaulay: The man who started it all, and his Minute. *Language in India, 3,(4).*

Thomas, M., Reinders, H., & Warschauer, M. (Eds.). (2012). *Contemporary computer-assisted language learning*. A&C Black.

Thornbury, S. (2005). *How to teach speaking*: Longman.

Tonekaboni, A. M.& Samaei, S. J. (2015) Teaching English Pronunciation by Applying different models in intermediate EFL learner centered classrooms. *Indian Journal of Fundamental and Applied Life Sciences.*

Trask, R. L. (2007). *Language and linguistics: The Key Concepts.* New York: Routledge.

Tuan, L. T. (2010). Teaching English Discrete Sounds through Minimal Pairs. *Journal of Language Teaching & Research, 1*(5). 540-561.

Tunio, S. S., Eng, L. S. Ismail, S. A. M. (2015) An Insight into the current scenario of English Grammar proficiency of undergraduate students and need of benchmarked assessment for English Grammar in Pakistan. *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*. 20, 5, PP 40-43.

Underhill, A. (2005). *Sound Foundations: Learning and teaching pronunciation*. Oxford: Macmillan Publishers Limited.

Uzum, H. (2009). Educational computer games and a case: Quest Atlantis. Pacesetter. University *Journal of Education*, 30, pp 220-229.

Van Han, N., & van Rensburg, H. (2014). The effect of computer assisted language learning (CALL) on performance in the test of english for International Communication (TOEIC) Listening. *English Language Teaching, 7*(2), 30-41.

Varasarin, P. (2007). *An action research study of pronunciation training, language learning strategies and speaking confidence* (Unpublished doctoral dissertation). Victoria University, Thailand.

VE, K. (2011). Breaking Language Teachers' Barriers to use Call Programme. *International Journal on Information Sciences and Computing, 2*(1).

Vygotsky, L. S. (1978). Mind in society: The development of higher mental process.

Walford, G. (Ed.). (2004). *Doing research about education*(Vol. 17). Bristol: Taylor & Francis e-Library.

Wang, X. & Munro, M. J. (2004). Computer-based training for learning English vowel contrasts. *System, 32*, 539–552.

Warschauer, M. (2000). The changing global economy and the future of English teaching. *Tesol Quarterly*, *34*(3), 511-535.

Warschauer, M. (2004*). Technological change and the future of CALL*. In New Perspectives on CALL for Second and Foreign Language Classrooms S. F & C. Brown (Eds.) (p. 15-25).

Warschauer, M., & Healey, D. (1998). Computers and language learning: An overview. *Language teaching*, *31*(2), 57-71.

Warsi, J. (2004). Conditions under which English is taught in Pakistan: An applied linguistic perspective. *Sarid Journal, 1*(1), 1-9.

Wegerif, R., Li Li., & Kaufman, J. C. (2015). *The Routledge international handbook of research on teaching thinking*. New York: Routledge

Waseem, F., & Jibeen, T. (2013). Anxiety amongst learners of English as a second language: An examination of motivational patterns in the Pakistani context. *International Journal of Humanities and Social Science, 3*(16), 174-184.

Woollard, J. (2010). *Psychology for the classroom: Behaviourism*. Routledge.

Woottipong, K. (2015). Learning Experience in Computer-Based Pronunciation Package. *Journal of Studies in Education*, *5*(3), 161-173.

Xiangui, Z. (2005). Learning theories and second language learning. *Celea Journal (bimonthly), 28*(5), 120-127.

Yang, Y. (2010). Computer-assisted Foreign Language Teaching: Theory and Practice. *Journal of Language Teaching & Research, 1*(6).

Yaqub, S. (2009). ELT in Pakistan. *English Language Learning Forum.* retrieved fromhttp://englishlanguagelearningforumblogspot.com on 23rd June, 2015.

Yates, L 2001, Teaching pronunciation in the AMEP:Current practice and professional development, AMEP Research Centre.

Zhang, F., & Yin, P. (2009). A study of pronunciation problems of English learners in China. *Asian social science, 5*(6), 141.

Zhang, F., Barber, B. (2008). *Handbook of research on computer-enhanced language acquisition and learning*. New York: Information Science Reference.

Zhao, Y. (2007). Social studies teachers' perspectives of technology integration. *Journal of technology and teacher education*, *15*(3), 311-333.

Zheng, H., & Wang, X. (2016). The use of electronic dictionaries in EFL classroom. *Studies in English language teaching*, *4*(1), 144.

Zubaidi, N, M, J. (2014). An Analytical study on identifying the causes of the difficulties faced by Arab teachers, teaching English as a second language while using Bilingual Method. *European Academic Research*. 2 (7).

Appendices

Appendix A

International Phonemic Alphabets (IPA)

Vowel sounds (20 sounds)

Single vowel sounds (12 sounds)

/iː/	/ɪ/	/ʊ/	/uː/
/e/	/ə/	/ɜː/	/ɔː/
/æ/	/ʌ/	/ɑː/	/ɒ/

Diphthongs (8 sounds)

/ɪə/	/eɪ/	/ʊə/	/ɔɪ/
/əʊ/	/ɑɪ/	/eə/	/aʊ/

Consonant Sounds (24 sounds)

/p/	/b/	/t/	/d/
/tʃ/	/dʒ/	/k/	/g/
/f/	/v/	/θ/	/ð/

/s/	/z/	/ʃ/	/ʒ/
/m/	/n/	/ŋ/	/h/

/l/	/r/	/w/	/j/

Appendix B

Likert Scale 1-9 Points for Pretest Pronunciation Assessment

1= Extremely Incorrect (VI) 2=Very Incorrect (VI)

3=Moderately Incorrect (MI) 4=Neither Incorrect nor Correct (NINC)

5=Slightly Correct (SC) 6=Moderately Correct (MC)

7=Slightly Incorrect (SI) 8=Very Correct (VC)

9=Extremely Correct (EC)

Material Used for Pretest

Words	Sounds	EI	VI	MI	SI	NINC	SC	MC	VC	EC
Me	**/(i:/**									
Look	**/ʊ/**									
Up	**/ʌ/**									
On	**/ɒ/**									
uh	**/ə/**									
ten	**/e/**									
hat	**/æ/**									
Shoe	**/u:/**									
Arm	**/ɑ/**									
saw	**/ɔ:/**									
Turn	**/ɜ:/**									

In /i:/									
Ear /ɪə/									
Poor /ʊə/									
Eye /ɒɪ/									
Noise /ɔɪ/									
Nose /əʊ/									
Hair /eə/									
Ow /aʊ/									
Pay /eɪ/									
Pop /p/									
Two /t/									
Church /tʃ/									
Cake /k/									
Fan /f/									
Three /ɸ/									
Six /s/									
Shoe /ʃ/									
Bus /b/									
Dog /d/									

Jam	**/dʒ/**									
Good	**/g/**									
Very	**/v/**									
The	**/ð/**									
Zoo	**/z/**									
Pleasure	**/ʒ/**									
Man	**/m/**									
Nine	**/n/**									
Wing	**/ŋ/**									
Happy	**/h/**									
Like	**/l/**									
Red	**/r/**									
Wind	**/w/**									
Yes	**/J/**									

Appendix C

Likert Scale 1-9 Points for Posttest Pronunciation Assessment

Words	Sounds	EI	VI	MI	SI	NINC	SC	MC	VC	EC
Read	**/i:/**									
Mill	**/i/**									
Shook	**/ʊ/**									
Rule	**/u:/**									
Pen	**/e/**									
Teacher	**(ə)**									
Turn	**/ɜ:/**									
Saw	**/ɔ:/**									
Jug	**/ʌ/**									
Bat	**/æ/**									
Arm	**/ɑ:/**									
On	**/ɒ/**									
Germs	**/dʒ/**									
Year	**/ɪə/**									
Hour	**/ʊə/**									
Chair	**/eə/**									
Pay	**/eɪ/**									

Boy /ɔɪ/									
Eye /ɒɪ/									
Go /əʊ/									
How /aʊ/									
Pay /eɪ/									
Pop /p/									
Teeth /t/									
Church /tʃ/									
Cake /k/									
Feather /f/									
Thorn /ɸ/									
Salt /s/									
Shoe /ʃ/									
Bug /b/									
Dad /d/									
Good /g/									
Vowel /v/									
Than /ð/									
Busy /z/									
Pleasure /ʒ/									

Man /m/									
Knees /n/									
Sing /ŋ/									
Happy /h/									
Leaf /l/									
Red /r/									
Warm /w/									
Yard /J/									

Appendix D

Pilot Testing for Reliability

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Me	141.85	203.713	.488	.715
Look	141.85	203.713	.488	.715
UP	141.35	224.345	.044	.740
On	142.75	218.513	.240	.730
Uh	142.95	233.839	-.270	.747
Ten	143.10	221.253	.200	.732
Hat	143.15	225.292	.092	.736
Shoe	142.80	227.747	-.032	.742
Arm	143.05	205.418	.684	.711
Saw	142.70	214.432	.273	.728
Turn	142.40	212.989	.271	.728
In	142.10	204.411	.441	.717
Ear	143.25	223.671	.146	.734
Poor	142.55	209.734	.491	.718
Eye	142.85	219.503	.225	.731
Noise	143.05	215.945	.475	.724
Nose	143.30	230.326	-.143	.741
Hair	142.75	214.829	.307	.727
Ow	143.95	231.839	-.250	.743
Pay	143.05	224.261	.092	.736
Pop	142.25	202.724	.441	.717
Two	142.85	224.450	.046	.740
Church	143.20	225.747	.033	.739
Cake	142.55	221.208	.230	.731
Fan	143.35	222.766	.143	.734
Three	143.00	242.737	-.369	.763
Six	143.15	221.713	.207	.732
Tissue	143.25	216.618	.331	.727
Bus	142.95	230.576	-.108	.749
Dog	142.80	217.326	.204	.732

Jam	142.80	235.642	-.233	.753
Good	143.05	217.839	.218	.731
Very	143.05	220.471	.222	.731
The	142.65	216.029	.212	.732
Zoo	142.80	204.379	.527	.714
Pleasure	143.65	227.397	.011	.738
Man	142.85	216.345	.294	.728
Nine	142.65	214.555	.315	.726
Wing	143.60	215.516	.369	.725
Happy	143.35	220.766	.228	.731
Like	143.35	218.029	.272	.729
Red	142.70	211.695	.330	.725
Wind	143.40	215.832	.319	.727
Yes	142.55	212.050	.324	.725

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
146.20	227.958	15.098	44

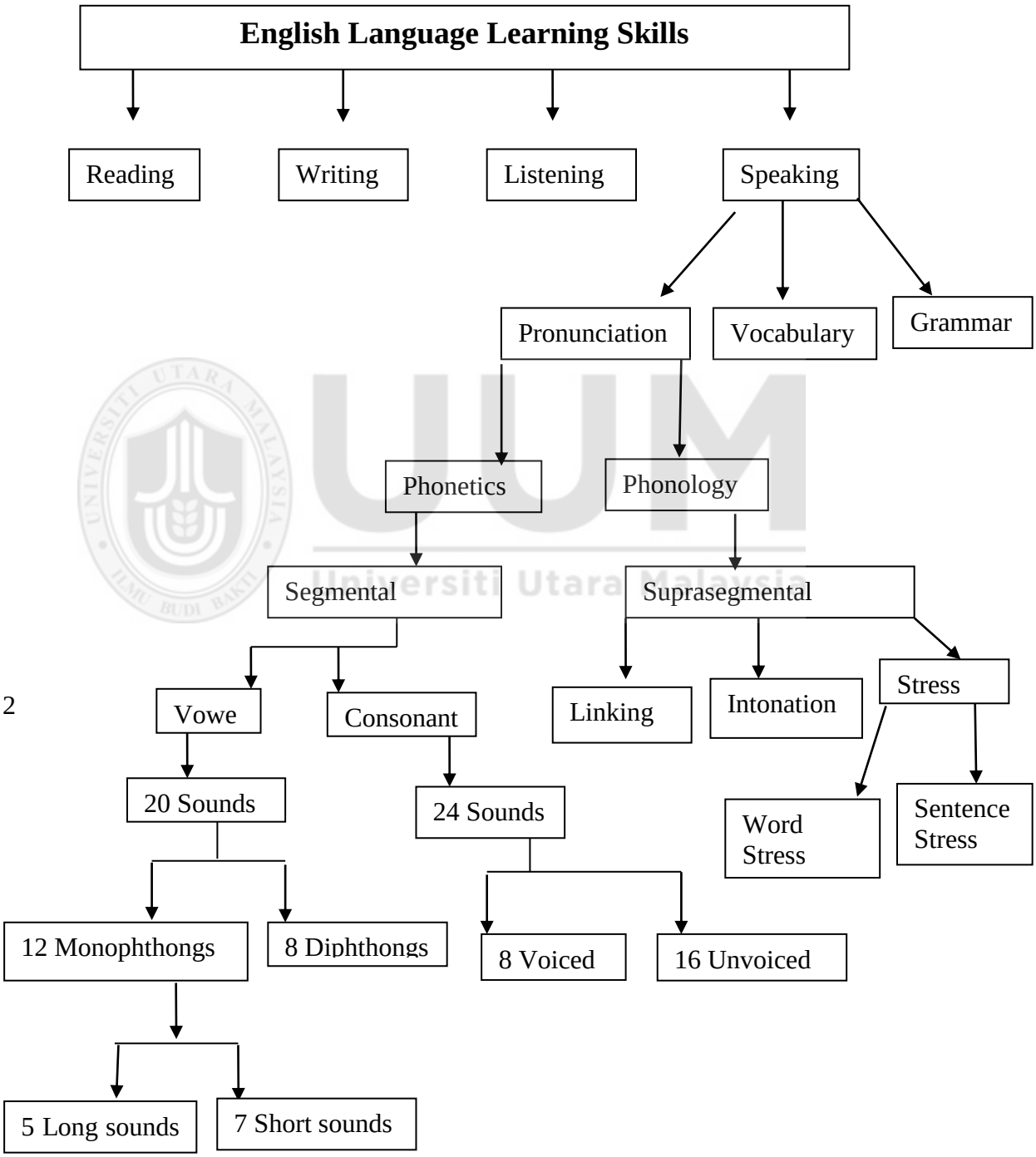
Reliability Coefficient

No of Students=20

Alph-.736

Appendix E

Introductory Lecture on Pronunciation Skill



2

Appendix F

CONSENT FORM

TITILE

The Effect of Computer Assisted Language Learning (CALL) on English Language Learners' Pronunciation in Secondary School in Pakistan.

Supervisor:	Prof. Madya Dr. Hisham B. Dzakikria
Student Researcher:	Perveen Akhter Farhat
Degree Studying:	Ph.D in Applied Linguistics
Institution:	University Utara Malaysia, Sintok, 06010, Keddah Malaysia.
Name of the School	Government Girls High School Hasilpure (old), District Bahwalpur, Punjab, Pakistan
Participant Class:	10th Graders (Females)
Commencing Date:	15th December 2016
Completion Date:	30th January 2017

Ethical Concerns: The names of the students will not be disclosed to anyone throughout the research program except the Student Researcher (herself) and Research Supervisor. The findings of the research may be published in journals during this research or after the completion of the research. However, the names of the students neither will be used in any of the research publications nor in the final submission of the thesis. All written work, recordings, and videos (taken in Pretest, Posttest& treatment) will be destroyed after the completion of this research and will not be employed anywhere else following this program.

I will be very thankful to you for this act of kindness, cooperation and fully supported environment regarding my research.

Student Researcher: Perveen Akhter Farhat _____

SIGNATURE OF THE PRINCIPAL DATE

_____ _____